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Small Arms Training

Volume I, Pamphlet No. 7.

·303 in. Machine Gun.

Part II.—Training.

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By Command of the Army Council.
P. J. GRIGG.

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GENERAL.

Small Arms Training, Vol I, Pamphlet No. 7, Part II, deals in general with the handling of the gun. It aims at training gun numbers in drill, and the application of drill to ground, thus fitting a man to take his place as a member of a machine gun team in battle.

It further aims at training headquarters of platoons and sections in their duties in the field.

The drills are arranged to meet the average conditions of mobile warfare. Latitude must be exercised in their application. For example, in an extensive programme shoot Nos. 2 may require assistance.

These drills are generally appropriate to cavalry. The duties given for the infantry are applicable to equivalent ranks in the cavalry.

DEFINITIONS.

(See also S.A.T., Vol. I, Pamphlet No. 7, Part III.)

Arc of Fire.—Arc over which it is desired that the guns can bear from a given gun position. Its boundaries are described as “right of arc” and “left of arc.”

Auxiliary Aiming Mark.—A gun aiming mark indicated by the fire controller in the target area, with the object of maintaining fire on the target. It is employed when, for any reason, a point of aim on the target is not used.

Deflection.—A lateral displacement of the lines of any or all guns.

Direct Fire.—When the gun is laid directly on the target by means of the backsight and foresight.

Fire Control.—The necessary arrangements and orders for hitting the target.

Fire Controller.—The individual responsible for giving the orders for the engagement of a target to the men of a fire unit.

Fire Direction.—The term applied to instructions given by the commander of more than one fire unit to the fire unit commanders as to how their fire is to be applied.

Gun Aiming Mark.—A mark on which a gun is laid to cause the bullets to strike the correct position on the target for that gun.

In Action.—A machine gun is said to be in action when it is mounted with reference to its arc of fire and the necessary men, equipment, and ammunition are present at the gun to enable fire to be opened when ordered.

Indirect Fire.—When the gun is laid to hit a given target by other means than by laying on it direct.

Laying.—The process of elevating (or depressing) and traversing a gun until its axis is made to point in any given direction. On conclusion of this process the gun is said to be laid.

Line.—The direction in which a gun or guns are pointed.

Near Limit of Arc.—The near edge of the zone on which fire is required.

Observed Fire.—When the effect of the fire can be observed from the gun or from the fire controller's observation post.

Observation Post.—A post from which a particular area can be kept under observation, or from which artillery and machine gun fire can be controlled and corrected.

Pivot Gun.—The gun used as a basis for calculation.

Position in Readiness.—The position at which the guns are taken off the vehicle or pack animals preparatory to coming into action. It will normally be the nearest point to the gun positions to which the vehicle or pack animals can be brought.

Registering.—The recording of the direction and elevation necessary to hit any given target as found by ranging.

Rendezvous.—A prearranged place of assembly (r.v.).

Zero Line.—A line of reference, on which all guns are parallel, and from which switches are measured.

Safety Precautions.

On all occasions when the gun and dummy cartridges are used for instructional purposes the instructor will carry out the following safety precautions:—

- i. Inspect all locks to ensure that the striker does not protrude through the firing-pin hole.
- ii. Inspect all ammunition to ensure that all cartridges are dummies.

NOTE.—When instruction is being given in mechanical subjects, D.P. stores, if available, will always be used.

SECTION 11.—ELEMENTARY GUN DRILL.

1. During elementary gun drill the gun will be mounted to suit the sitting position, but emphasis will be laid on the fact that, on active service, the tripod will always be adjusted to suit the ground and available cover.

2. The object of elementary gun drill is to render the man proficient in the duties of gun numbers in handling the weapon.

3. It aims at teaching the man—

- i. To mount and dismount the gun.
- ii. To load and unload the gun.
- iii. To bring the gun into action.
- iv. To cease firing.
- v. To adjust the sights and lay the gun.
- vi. To fire the gun, to stop firing, and to go on firing.
- vii. Consistency of tap and adjustment of clamp, traversing and the swinging traverse.
- viii. Controlled corrections, direct and indirect fire.

Instructor's Notes.

Method of Carrying out the Drill.

1. The stores required vary according to the portion of the drill which is being carried out, but for all drills the squad requires a gun, tripod, spare parts case complete, condenser can and tube, and one ammunition box with belts and dummy cartridges. When additional stores are required, details are given in the instructional notes. The condenser tube will consist of a piece of $1\frac{1}{2}$ in. rope, 6 ft. long.

2. Laying out the Stores.—Before the squad falls in, the gun and tripod will be placed in line on the ground a few paces apart, tripod on the left with the legs to the rear; the muzzle of the gun pointing to the front, the condenser tube attached, and the spare parts case close to and on the right of the gun. The ammunition box and condenser can will be placed about a pace apart with the condenser can on the right, a few paces in rear of the gun and tripod.

3. Fall in.—The squad is fallen in, in single rank. The instructor details any three men. He falls them in a short distance in rear of the stores and numbers them off. The remainder of the squad under instruction is placed in such a position that the maximum benefit is derived, although they themselves are not at the moment acting as Nos. 1, 2, or 3.

If at any time the instructor wishes to change round Nos. 1, 2, and 3, he should order "Fall out 1." No. 1 becomes No. 3, No. 2 becomes No. 1, and No. 3 becomes No. 2, the detachment

renumbering at once, the instructor detailing three fresh numbers to take their place when he wishes to do so.

4. The instructor must see that the standard of drill is maintained throughout, that the Nos. remain still and correctly placed on the completion of any necessary movement, particularly in the sitting or lying positions.

When the instructor wishes to explain, criticize, or demonstrate, he will first order "Rest" to allow of relaxation of the muscles. Before the drill is resumed he will ensure that the Nos. adopt the correct position, alert and ready for any order. This will be effected by the order "Position."

So far as is possible, the duties of No. 1 will first be taught, and practised by the whole squad. The instructor will then teach and practise the duties of Nos. 2 and 3 in that order, before drilling the detachment collectively.

5. The orders given by the instructor are given in inverted commas at the head of each paragraph. All orders will be given verbally.

LESSON 45.—TAKE POST.

"Take Post."

The detachment will turn to the right, with the exception of No. 1. No. 1 doubles forward and lies down on the left of the tripod. He inspects the tripod to see that the elevating and crosshead joint pins are properly in position and turned down, both elevating screws equally exposed, traversing clamp sufficiently tight to prevent the crosshead from swinging round when the tripod is being carried, the crosshead over the rear leg, direction dial secure, and all three legs together and clamped securely.

When Nos. 2 and 3 have reported to him, he reports "**All correct**" (or otherwise) to the instructor.

No. 2 doubles forward, lies down on the right side of the gun. He places the strap of the spare parts case on his right shoulder, and inspects the gun to see that the muzzle attachment and blast deflector are correctly adjusted, and the condenser tube fitted, that the feedblock is in the gun, and the front cover locked, that the sliding shutter is closed, the tangent sight set at 600, that the lock is in the gun, and that the "T" fixing pin is screwed home and vertical. He reports "**Gun correct**" (or otherwise) to No. 1.

No. 3 doubles forward and lies down between the condenser can and ammunition box. He inspects the liners to see that the rounds are in front of the belts and pointing the right way. He closes and fastens the box. He inspects the condenser can to see that the cap is screwed in position and that the filler

is secure. He reports "**ammunition and condenser can correct**" (or otherwise) to No. 1.

All Nos. will now lie facing forward with their arms folded.

NOTE.—When the ground is too wet, the detachment should be instructed to kneel instead of lying down, but waterproof sheets should be used to avoid this when possible.

LESSON 46.—MOUNT AND DISMOUNT GUN.

Instructor's Notes.

The instructor will indicate to No. 1 the spot over which the socket is to be mounted, and the direction in which the gun will point. This spot should be a few yards in front of No. 1.

The action of No. 1 in mounting and dismounting the TRIPOD will be taught first, ending and beginning respectively at the point where No. 1 is seated behind the tripod, and has withdrawn the pins.

The remaining duties of No. 1 and the duties of Nos. 2 and 3 will then be taught in that order.

"Mount gun."

No. 1 jumps to his feet, picks up the tripod and doubles forward with it, placing it on the ground with the socket on the spot indicated. Standing astride the legs, he loosens both jamming handles simultaneously, grasps the crosshead bracket as far forward as possible with both hands, and with a forward and upward movement, erects the tripod (Plate 6). Supporting the tripod with the left hand at the crosshead bracket, the left forearm resting on the thigh, he ensures that the rear leg is on the ground and the socket upright over the spot indicated and tightens up both jamming handles with the right hand if possible. After putting a final pressure with each hand on the jamming handles, he sits down behind the tripod, removing the elevating and crosshead joint pins.

As soon as No. 2 places the gun on the tripod No. 1 hands No. 2 the crosshead joint pin, and grips the left traversing handle with the left hand. When No. 2 has inserted the crosshead joint pin, No. 1 will insert the elevating joint pin and turn the handle down. He levels the gun by means of the elevating wheel, tests by tapping the traversing handles to see if the adjustment of the traversing clamp is approximately correct, tightening or loosening it if necessary, and sits, looking straight in front of him, with his elbows supported by the inside of his thighs, his third and little fingers round the traversing handles, forefingers on top, second finger underneath the safety catch, and thumbs resting lightly on the thumbpiece.

No. 2 opens the sliding shutter, and, picking up the gun with his left hand grasping the right traversing handle and his right arm over the barrel casing, doubles forward to the right side of the tripod, arriving about the time No. 1 is removing the pins. He sinks on to the left knee, places the gun on the tripod, supporting the barrel casing with his right thigh, and with his right hand drives in the crosshead joint pin which No. 1 has handed to him, finally turning the handle down (Plate 7). He retains his hold with his left hand on the right traversing handle until the pin is home. He lies down on the right of the gun, looking towards the gun, his head in line with, but below the level of the feedblock. When No. 3 has brought up the ammunition box and condenser can, No. 2 places the former in line with the feedblock, and inserts the condenser tube into the latter.

No. 3 removes the wooden cover of the ammunition box, rips open the lids of the liners, presses down the lids of the liners, and replaces the wooden cover.

No. 3 unscrews, but not completely so, the cap of the condenser can. He doubles forward to the right side of the gun, carrying the ammunition box in his left hand, the condenser can in his right, arriving just as No. 2 lies down. He places the condenser can in a suitable position near the tripod, and the ammunition box within easy reach of No. 2, with the securing pin towards the feedblock. He removes the cap of the condenser can, doubles back to a suitable position and lies down.

NOTE.—When the gun has been mounted and Nos. 1, 2, and 3 are in position, the instructor should remark whether:—

The actions of Nos. 1, 2, and 3 and their final positions were correct.

The tripod is mounted with reference to the direction indicated.

The gun is level and crosshead over the rear leg.

The socket is upright and over the spot indicated.

The tripod is at a suitable height for No. 1 (until No. 1 has been taught to mount the gun in service positions, the instructor will see that the rear leg is suitably adjusted before the gun is mounted).

The sliding shutter is open.

The traversing clamp is not too loose.

The elevating and crosshead joint pins are home and locked.

The jamming handles are really tight.

The ammunition box is close to, and in line with, the feedblock, with the securing pin disengaged, condenser can in position, and tube inserted in it.

The squad will be shown how to correct a leaning mounting on the first occasion it arises.



PLATE 7.
MOUNTING THE GUN.

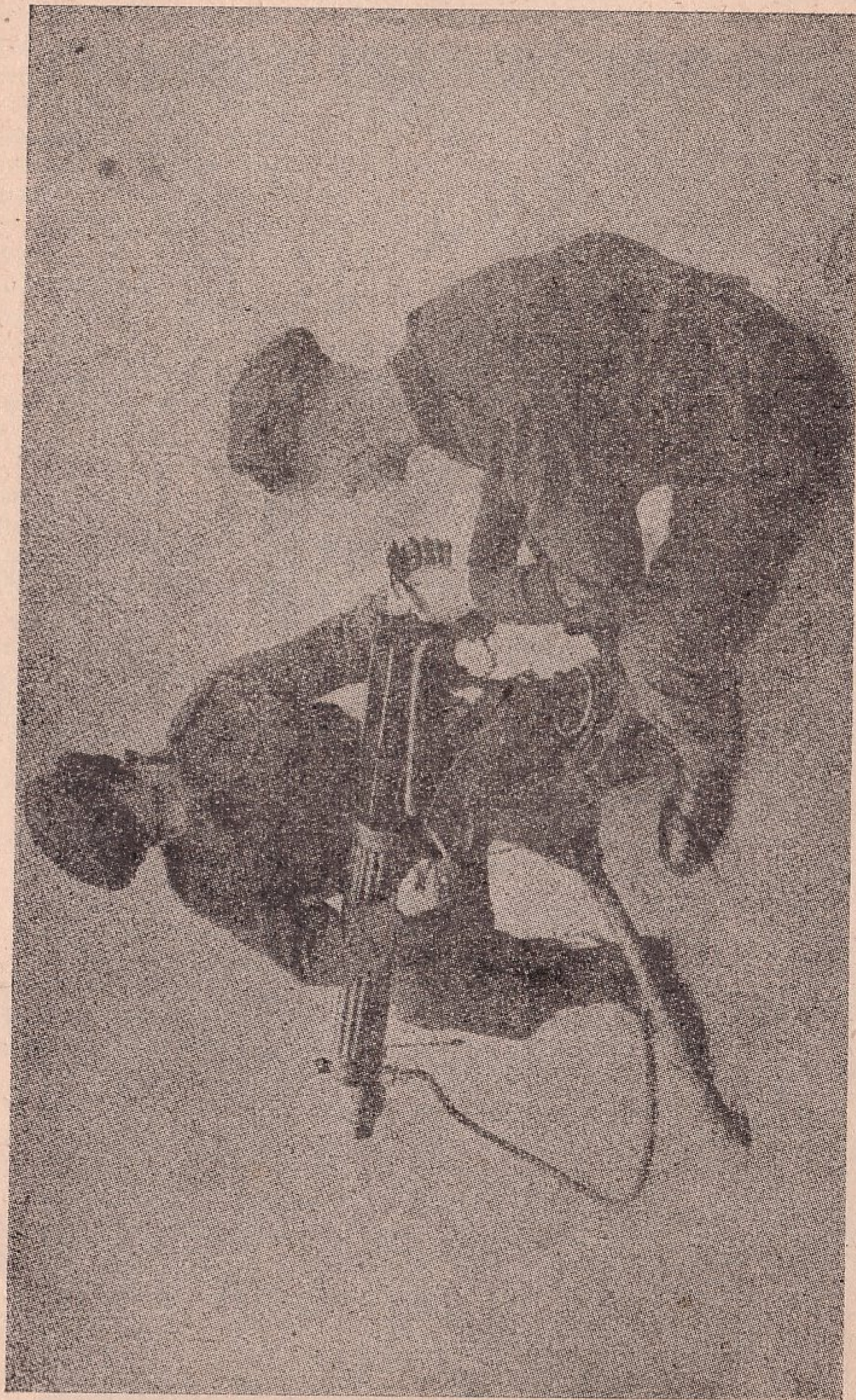
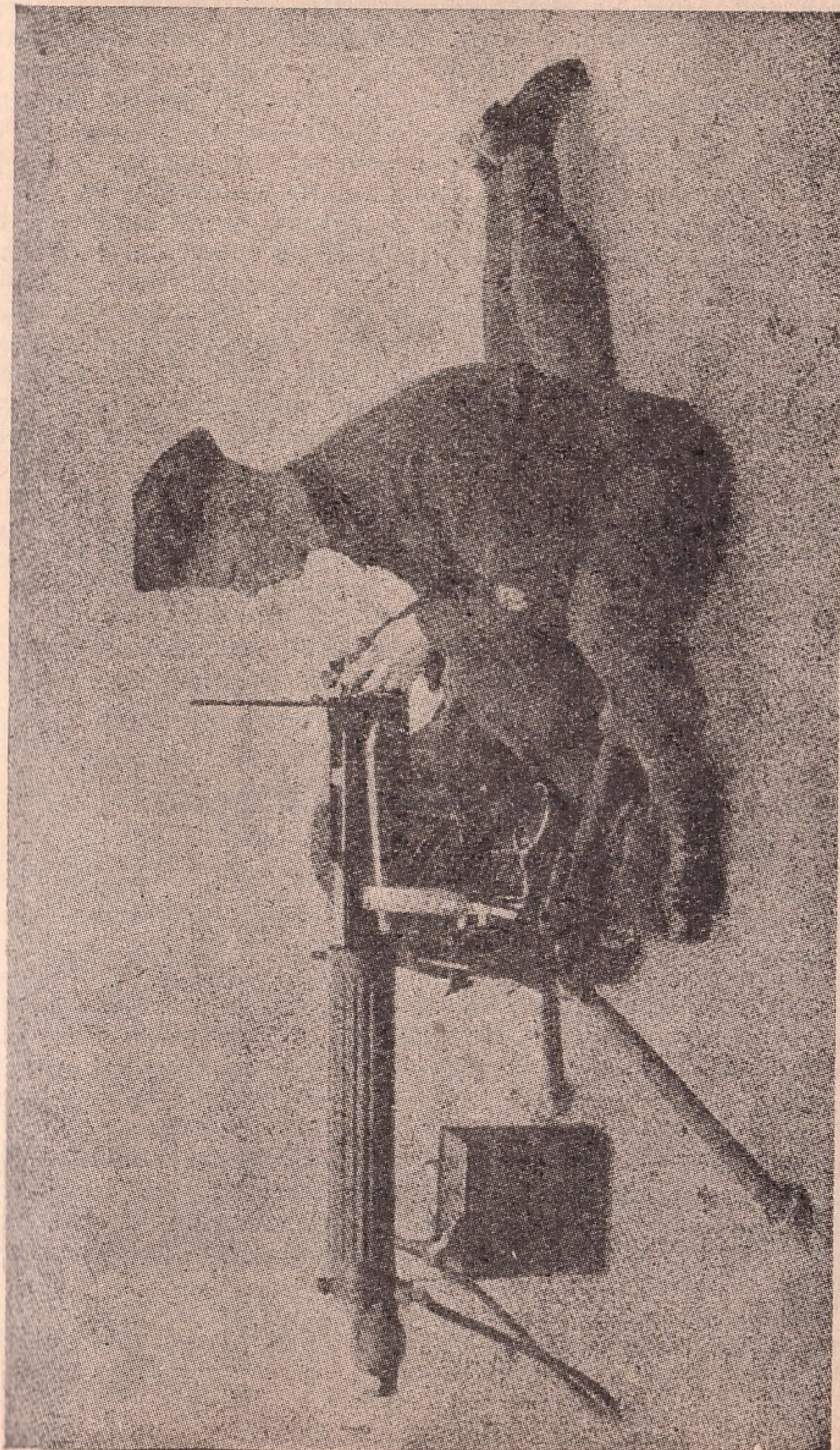


PLATE 8.
FIRING POSITION SITTING.



"Dismount gun."

No. 1 removes both pins, steadies the gun with his right hand, and, after No. 2 has removed the gun, replaces the pins and turns the handles down. He jumps to his feet, stands astride the tripod and loosens both jamming handles simultaneously, allowing the tripod to collapse on the ground. Grasping the crosshead bracket with both hands, and giving the tripod a sharp upward and forward movement, he folds up the legs and places the tripod on the ground. He clamps up both jamming handles and lies down on the left of the tripod. He reconditions the tripod, if necessary, as in "Take post."

No. 2 pushes the ammunition box to the right, jumps to his feet, and, after No. 1 has removed the pins, lifts the gun off the tripod. He moves to the right clear of No. 1, closes the sliding shutter, and places the gun on the ground. He lies down on the right side of the gun, reconditioning it, if necessary, as in "Take post."

No. 3 doubles forward, seizes the ammunition box in his left hand and the condenser can in his right, and places them on the ground a few paces in rear. He lies down between the ammunition box and condenser can, reconditioning them as in "Take post."

NOTE.—*The instructor will order "Replace stores" when he wishes the stores to be returned to their position as originally laid out.*

LESSON 47.—LOAD AND UNLOAD.

"Load."

No. 1 pulls the crank handle on to the roller with the right hand, and advances his left hand to the left of the feedblock, ready to grip the belt. When No. 2 has passed the tag of the belt through the feedblock, No. 1 grips it and pulls the belt through the feedblock as far as possible. He must pull the belt gently and straight when doing so. He releases the crank handle and repeats the above movements. Whilst pulling the crank handle on to the roller the belt will be held, but not pulled, with the left hand.

No. 2 opens the ammunition box, seizes the end of a belt with the right hand at the point where the tag joins the fabric, forefinger along the tag, and pushes the tag through the feedblock as far as possible. He must ensure that the belt is not twisted on entering the feedblock.

Emphasize that the belt must be pulled gently and straight through the feedblock. The men must avoid the natural

tendency to pull it to the rear—i.e., towards No. 1—which might prevent the round being fed correctly into the feedblock.

Should any man exhibit a tendency to slur the loading motions it may be advisable to make him load "by numbers," counting aloud while doing so.

The actions of Nos. 1 and 2 in loading and unloading will be taught together.

"Unload."

If the tangent sight has been in use it will be lowered by the No. 1, using his left hand. At the same time, without touching the belt, he pulls the crank handle on to the roller twice in succession with the right hand, allowing it to fly forward again in each case. He presses the top and bottom pawls of the feedblock with his right hand, the top pawls with the fingers and the bottom with the thumb, taking care to keep his hand clear of the entrance to the feedblock. When the belt is being withdrawn and the last round is clear of the feedblock, he will press the thumbpiece.

No. 2 withdraws the belt from the feedblock when No. 1 presses the pawls, steadying the belt with his left hand near the ammunition box and his right hand near the feedblock. He packs the belt correctly in the liner, presses down the lids, and replaces the wooden cover.

LESSON 48.—ACTION AND CEASE FIRING.

"Action."

Nos. 1, 2, and 3 perform the duties learnt in "Mount gun" and "Load," the gun being loaded as soon as it is correctly mounted (Plate 8).

"Cease firing."

Nos. 1, 2, and 3 perform the duties learnt in "Unload" and "Dismount gun," the gun being dismounted as soon as it has been unloaded correctly.

LESSON 49.—CLEAR GUN AND STAND CLEAR.

"Clear gun."

No. 1 pulls the crank handle on to the roller, raises the rear cover, removes the lock from the lock guides, and eases the crank handle forward, allowing the lock to rest against the hinge of the rear cover. He reports "**Gun clear.**"

NOTE.—*If it is desirable to replace the lock in the gun and close the rear cover, but not to load the gun, the command "Lock in—cover down" may be used. If the gun is loaded, "Clear gun" will be preceded by "Unload."*

"Stand clear."

Nos. 1, 2, and 3 jump to their feet and stand at ease in rear of the gun, No. 2 on the right.

Nos. 1 and 2 will leave dial sights, if in use, and spare parts case on the position.

NOTE.—The order "Take post" will be used when it is desired that Nos. 1 and 2 should adopt their positions at the gun.

LESSON 50.—TO ADJUST THE SIGHTS AND LAY THE GUN.

Instructor's Notes.

Before the lesson is begun, instruction in aiming must have been given.

A few simple targets will be pointed out, the object being not to teach recognition, but clean and accurate handling by the No. 1.

The instructor should order "Lay" when he wants No. 1 to do so.

If no natural aiming points are available, a landscape target may be used, being placed at any convenient distance from the gun.

The gun will be loaded before the exercise begins.

".... hundred (or fifty) Indication lay."

No. 1 raises the tangent sight and adjusts the slide to the range ordered. When ordered, he begins to lay the gun by tapping it until the correct direction is obtained, and elevating or depressing until the aim is correct. He orders No. 2 to loosen the traversing clamp when a large change in direction is necessary, and to tighten the clamp again when the gun is roughly aligned on the target. No. 1 retests his clamp.

When tapping the gun, or turning the wheel, No. 1 maintains control of the gun by keeping the disengaged hand on the traversing handle. When the gun is laid he orders "On" to No. 2, who raises his left hand in line with No. 1's shoulder; at the same time No. 1 raising the safety catch with his second fingers.

Should No. 1 fail to understand an order at any time he will call "Repeat."

LESSON 51.—FIRE, STOP, AND GO ON.

"Fire."

No. 1 instantly presses in the thumbpiece as far as possible by a quick and even movement of the thumbs, keeping his eyes directly on the target. He will fire in bursts, keeping the

thumbpiece pressed for about four seconds before releasing and pressing again, occasionally checking his aim between bursts. No. 2 lowers his hand.

"Stop."

No. 1 immediately releases pressure on the thumbpiece and safety catch. He checks his aim, relaying on to the original point of aim if necessary.

NOTE.—The wheel should occasionally be turned while No. 1 is firing, in order to ensure correct relaying when "Stop" is ordered.

"Go on."

No. 1 resumes the action as detailed under "Fire."

LESSON 52.—CONSISTENCY OF TAP AND ADJUSTMENT OF CLAMP.

Instructor's Note.

The gun will be loaded.

1. To teach a Consistent Tap.

The object is to develop a consistent automatic tap, in order that the line of sight is displaced the same amount each time the gun is tapped.

Each man will be practised in tapping the gun in both directions, the instructor noting the consistency. Correct holding will be taken after each tap.

NOTE.—The instructor will explain the following points:—

- i. A strong tap with a tight clamp is preferable to a weak tap with a loose clamp.
- ii. When tapping with either hand, the gun must be held correctly with the other hand, and the safety catch kept raised.
- iii. The eyes must be directed to the front, and not at the rear end of the gun or along the sights.

2. To adjust the Clamp.

Instructor's Note.

Additional stores: M.G. target (S.A.T., Vol. V, 1931, Plate 66).

The gun will be mounted and loaded 25 yards from the target.

The object is to ascertain the degree of tightness required in the traversing clamp in order that the line of sight may be displaced 15 minutes each time the gun is tapped.

The instructor will teach how to test and adjust the clamp. He will explain to the men that the interval between bulls, at a distance of 25 yards, subtends 15 minutes. He will ensure that if the gun moves too much or too little when the men are testing the clamp, that the clamp is altered and not the tap.

Whenever the gun is mounted, or a new No. 1 takes post at the gun, No. 1 tests the adjustment. The instructor should point out the importance of this test, and also the importance of the "feel" of the correct tightness, as later on no row of bulls will be available to assist in the adjustment.

3. Combination of Consistency and Judgment.

The object of this exercise is to test the man's consistency of tap and adjustment of clamp.

The instructor will inform the No. 1 which way he has to tap, will then give a suitable range, and order to get the gun laid on to one end of a horizontal row of bulls.

When ordered, No. 1 will lay the gun on to the bull's-eye indicated.

On the order "**Fire,**" No. 1 fires a burst, releases pressure on the thumbpiece, and strikes the traversing handle, deflecting the gun through an angle of 15 minutes. He fires another burst, taps as before, and will continue to do so, firing a burst after each tap until ordered to stop.

NOTES.—(1) The instructor will warn the No. 1 that in this particular case he will **not** check his aim or relay between bursts or on the command "Stop."

(2) The men will be exercised in traversing in both directions.

(3) Progressive instruction will be given in tapping right and left on a M.G. target.

LESSON 53.—TRAVERSING.

Instructor's Notes.

Additional stores: M.G. target (S.A.T., Vol. V., 1931, Plate 66).

The instructor will explain that the object of this lesson is that in traversing the firer will combine consistency of tapping with maintenance of the line of sight on the target.

For drill in traversing, the gun will be mounted and loaded 25 yards from the M.G. target.

The instructor will inform the No. 1 which way he has to traverse; he will then give a suitable range, and order to get the gun laid on to one end of an oblique row of bulls.

No. 1 proceeds as in Lesson 52 (3), except that after each tap, before firing again, he relays his gun on to the target immediately above or below the point to which his tap has carried it.

NOTE.—The instructor will warn the No. 1 in order that his accuracy of traversing may be ascertained, he will **not** check his aim or relay on the command "Stop."

LESSON 54.—SWINGING TRAVERSE.

Instructor's Note.

Additional stores: M.G. target (S.A.T., Vol. V, 1931, Plate 66).

No. 1 loosens his traversing clamp and then lays as before on the right or left end of the target. When ordered to fire, he swings the gun slowly to the right or left, maintaining pressure on the thumbpiece throughout. He moves the gun, not by a movement of the forearms alone, but by keeping the upper part of the body fairly rigid and forcing it over in the required direction.

NOTE.—*Explain that this method of traversing is only employed against linear targets at very close ranges, when the normal method of traversing is likely to prove too slow.*

The following points will be explained:—

- i. *The traversing clamp must not be so loose that No. 1 loses control of the gun, the vibration of the gun rendering it easy to swing.*
- ii *The rate of movement should be such that the line of sight is moved about 1 yard in two seconds, when the target is 25 yards from the gun. The movement of the gun is almost imperceptible.*
- iii. *The thumbpiece should be pressed before the gun begins to move.*

The importance of the mounting being upright must be emphasized.

- iv. *The above principles alone will be explained to the men, as proficiency can only be obtained when the gun is being fired.*

LESSON 55.—CONTROLLED CORRECTIONS, DIRECT.

Instructor's Notes.

The gun will be loaded and fire opened before the lesson begins.

The object is to teach No. 1 to relay the gun after altering the sights in obedience to a correction in elevation.

"Stop Up (or Down) Go on."

No. 1 adjusts his sights in accordance with the order, relays on to his original point of aim by turning the handwheel, and continues firing.

**LESSON 56.—CONTROLLED CORRECTIONS.
INDIRECT.**

Instructor's Notes.

Additional stores: Dial sight and aiming post.

The gun will be mounted, dial sight attached, and an aiming post put out about 15 yards in front and to a flank. A suitable range will be set on the range drum of the dial sight, and the instructor will adjust the collimator to the aiming post.

Before this lesson No. 1 must have received instruction in the use of the graduations on the elevation drums of the dial sight. He should have an elementary knowledge of the functions of the aiming post.

1. Elevation.

The object is to teach the No. 1 to relevel the bubble after adjusting the range drum, or angle of sight drum of the dial sight, in obedience to a correction in elevation.

i. **"Stop Up (or Down) Hundred (or Fifty) Go on."**

No. 1 adjusts the range drum as ordered, elevates or depresses the gun by turning the handwheel until the bubble is central, checks and, if necessary, adjusts the alignment of the collimator.

ii. **"Stop Up (or Down) Min. . . . Go on."**

No. 1 adjusts the angle of sight drum as ordered, elevates or depresses the gun by turning the handwheel until the bubble is central, checks and, if necessary, adjusts the alignment of the collimator.

2. Deflection.

The object is to teach the No. 1 to relay on to the aiming post, after adjusting the deflection drum, in obedience to a correction in deflection.

"Stop. Right (or Left) degrees minutes."

No. 1 adjusts the deflection drum as ordered, then taps the gun over until the aim is again relaid on to the aiming post. When relaid the bubble should be central; if not, the No. 1 will centralize it by turning the handwheel, and readjust the collimator on to the aiming post.

**SECTION 12.—TESTS OF ELEMENTARY GUN DRILL
AND INSTRUMENTS.**

1. The following tests have been devised to assist officers in testing the efficiency of their men in elementary gun drill, and to ensure that no detail of the drill is overlooked. It is important that these tests should not be considered solely as competitions against time, for although quickness is necessary, accuracy is the first essential. No man should therefore be passed as efficient unless all the points are correctly carried out, even though he may complete them in the standard time. Men who, whilst passing the tests for accuracy, slightly exceed the standard time should be tested again before being put back for further instruction.

2. The tests must be carried out in strict accordance with the detailed instructions given under the appropriate paragraphs of elementary gun drill, for unless the smallest details are insisted upon, the time limit will not be applicable. In carrying out the tests time can be saved if the first detachment complete tests 1 to 4 consecutively; the remainder can be carried out as convenient.

3. It should be noted in tests 1, 2, 3, and 4 that **all** numbers are being tested in their own particular duties as No. 1, No. 2, or No. 3, and the tests should not be regarded as a test of the No. 1 only. Therefore, a man is not considered to have passed these tests until he has passed in the duties of all numbers.

4. It is essential for each man to have passed tests 1 to 9 before proceeding with the annual machine gun course.

A record will be kept by each company commander and produced for inspection as required.

5. Method of conducting the Tests.

The conditions of the test will be explained before the test begins, including the time allowed for the test, and when the time allowance begins and finishes.

NOTE.—If a stop-watch is not available, a timekeeper must be appointed.

Stores required: As for all elementary gun drill in tests 1 to 8.

Words of command will be given as in the appropriate heading in elementary gun drill.

Test No. 10 will be carried out by full rank N.C.O.s only.

Name of Test.	Conditions before Test.	Number of Tests.	Time allowed.	To pass.	Remarks.
(1) No. 1: Mount gun	(2) Nos. 1, 2, and 3 will Take post. Stores laid out not more than 5 yards from the place where the gun is to be mounted Gun mounted. Ammunition box closed, securing pin undone. Nos. 1 and 2—Take post Gun mounted and loaded. Nos. 1 and 2—Take post	(3) One	(4) 25 seconds from command "Gun" until all numbers are still	(5) All points of elementary drill correct	(6) ..
No. 2: Load		One	5 seconds from command "Load" until No. 1 has got correct holding	Gun correctly loaded	..
No. 3: Unload		One	5 seconds from command "Unload" until ammunition box is closed	Gun correctly unloaded	..
No. 4: Dismount gun	Gun mounted. Nos. 1, 2, and 3—Take post	One	20 seconds from command "Gun" until all Nos. are still	All points of elementary drill correct.	..
No. 5: To adjust the sights and lay the gun	The gun will be loaded. Three targets will be pointed out. Tangent sights lowered and set at 600x Nos. 1 and 2—Take post Gun mounted 25 yds. from the M.G. target and loaded. No. 1 will be given an opportunity to test his clamp. The M.G. target will not be used for this purpose. Nos. 1 and 2—Take post	Three	12 seconds from the range being ordered until No. 2 holds up his hand	Sight set correctly and accurate aim	No. 1 will not be informed of the order in which the targets will be given out. Different ranges will be ordered for each target.
No. 6: Traversing		Two	No time limit imposed	When checked at any time to be within 15' for direction. Elevation to be correct	The test consists of traversing from left to right and from right to left. A complete row of oblique bulls will be traversed in each case. The order "Stop," will be

<p><i>given once, but not before the centre of the traverse has been reached. The aim will be checked after the order "Stop," and when the end of the traverse is reached. Tapping back to correct errors is not allowed.</i></p> <p>Corrections up or down will not exceed 300 yards. One of these tests will be carried out with No. 1 wearing his gas respirator.</p> <p>Corrections up or down will not exceed 300 yards. The error in levelling the bubble will be ascertained by using the angle of sight drum.</p> <p>Corrections right or left will not exceed 4° and will always include 100 of minutes. Bubble checked by angle of sight drum.</p>					
No. 7: Controlled corrections— (a) Direct fire	Gun mounted, loaded, and laid on a target Nos. 1 and 2—Take post	Three	8 seconds from the command "Hundred" until No. 1 presses the thumbpiece	Sight correctly adjusted and correctly relayed	
(b) Indirect fire (Elevation)	Gun mounted and loaded, dial sight attached, aiming post put out. Range drum set at any range. Angle of sight drum at zero. The bubble will be central and a correct aim laid on the aiming post. Nos. 1 and 2—Take post As in (b) above. Deflection drums and dial to be at zero at the beginning of each of the three tests	Three	12 seconds from the command "Hundred" until No. 1 has pressed the thumbpiece	Correct setting on the range drum and the bubble level within 2 minutes	
(c) Indirect fire (Deflection)		Three	15 seconds from the command "Minutes" until No. 1 has retained his holding	Correct setting on the deflection drums. Bubble central to within 2 minutes. Aim correctly relaid on aiming post	

Name of Test.	Conditions before Test.	Number of Tests.	Time allowed.	To pass.	Remarks.
(1) No. 8: Laying the gun in- for elevation, direct	(2) Gun mounted, dial sight attached. All scales set at zero. Gun approximately level	(3) Three	(4) 15 seconds from the command "Hundred," until No. 1 has retained his holding	(5) Correct setting on the range and angle of sight drums. Bubble level to within 2 minutes	(6) Ranges ordered will be between, 1,200 and 2,000 yards. Angle of sight of not more than 1° plus or minus will be ordered, and will include 5 minutes. In order that the time taken to give out the order will not interfere with the time allowed for the test, the angle of sight will be given immediately after range. The test consists of rectifying the stoppage of all four guns in turn. The No. 1 being tested will be warned that when he has carried out the immediate action on a gun, he will immediately double to the next gun, until the last gun is reached. Time will be taken from the command "Go" until the testing N.C.O. calls "Up," when the immediate action is complete on the last gun. The time is taken of each individual, and the average, time worked out and points awarded as follows:—
No. 9: Immediate action. Additional stores as for teaching immediate action	4 guns will be mounted about three yards apart. Stoppages set up, crank handles covered and the guns laid off the aiming mark. The testing N.C.O. at each gun will have a spare lock and clearing plug. One stoppage in each position will be set up. Special stoppages not to be included NOTE.—The testing N.C.O. will act as No. 2	One (Carry out immediate action on 4 guns)	No time limit imposed. Average time used in assessing points (see remarks)	Not less than 60 points	

No. 10: Director Stores required:— 1 director 1 aiming post	An aiming post will be put out to represent a gun, a director will be mounted 50 yards in front of it. Director level bubble central, the index plate at 180° and the socket unclamped. The target on which the director is to be laid will be indicated. The director will be laid within 10° either side of the target	One	30 seconds from the command "Go," until the angles have been called out	Angles correct within 10 minutes for direction and within 5 minutes for elevation	For every 5 seconds or part of 5 seconds below the average time add 1 point to points gained in immediate action. For 5 seconds or part of 5 seconds above the average time deduct 1 point. Total points awarded for correct immediate action carried out on each gun 20. Deductions:— Totally incorrect: 20 points. Partially incorrect: 5 points. Guns not relaid: 5 points. Incorrect aim: 2 points. Minor errors: 2 points. Not changing lock when required: 10 points. The angle of sight to the target (which must be clearly defined) must not exceed 1° plus or minus. The N.C.O. being tested will lay on the target and measure the angle of sight. He will then measure the angle of direction to the aiming post, Both angles being called out.
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SECTION 13.—SIGNALS.

1. In addition to the signals already taught in Infantry Training, 1937, Secs. 30-32, the following signals are necessary for fire control and use in the field by machine gun units.

2. They will be more easily remembered if, instead of being taught in one lesson, they are introduced when the relative stage of training is reached.

3. Fire Control Signals.

Signal.	Interpretation.	When taught.
(1) No. 2 with his hand raised in line with and behind the shoulder of No. 1	(2) Gun ready to fire	(3) Whilst teaching adjusting the sights and laying the gun, E.G.D.

NOTE.—If "wind" is ordered No. 2 will lower his hand on receipt of the allowance. He will raise his hand again when No. 1 has made the necessary allowance.

Both arms fully extended, raised from the sides to a position level with the shoulders and lowered again. This motion is repeated quickly several times	Action	} Before and during section drill, direct fire.
Arm swung in a circular motion in front of the body	Cease firing	
Fire controller with his hand raised above the shoulder	Prepare to fire	
Fire controller's hand lowered to the side	Fire	
Fire controller's arm waved horizontally to and fro	Stop	

NOTE—No. 2 will order No. 1 to stop.

Fire controller—

Semaphore.	When using QE.	When using QA.	} During platoon drill, indirect fire.
U	Up 50 yards	Up 10'	
N	Down 50 yards	Down 10'	
T	Right 30'		
L	Left 30'		

4. Field Signals.

A. Platoon sergt. or Section comdrs. or Section cpls.	} To join immediate superior	} Before section training.
AA. All N.C.O.s to join platoon comdr.		
B. More ammunition required	} During section drill.	
H. Trucks to come forward		
W. Water required		

SECTION 14.—ADVANCED MACHINE GUN HANDLING.

The object is to adapt the lessons taught in elementary gun drill as far as possible to service conditions.

This subject provides an essential link between drills and collective training, and should be taught to the men as soon as they are proficient in elementary gun drill. It should be practised again within each section at the beginning of the period allotted for section training.

LESSON 57.—MAN-HANDLING OF LOADS.

Instructor's Note.

Stores :—

Gun, tripod, condenser can and tube, three ammunition boxes with belts and dummy cartridges. Spare parts case : all to be at service weights.

I. Explain and Demonstrate.

The methods of carrying the gun, tripod, &c., taught in drills are not always the most convenient for carrying long distances, or when concealment from ground observation is necessary. Any comfortable method may be adopted, which does not damage the load, and conceals from the enemy the nature of the load carried. The following methods are suggested :—

i. Tripod—

- (a) Walking or doubling : Under the arm or in front of the body.
- (b) Crawling : Any convenient method. The tripod may be dragged along the ground, provided that the dial is not damaged.

ii. Gun—

- (a) Walking or Doubling : Across the body, barrel casing resting on the right forearm, left hand gripping the left traversing handle and free end of the condenser tube ; or

Close to the right side with the muzzle pointing upwards. It will be held at the crosshead bracket with the right hand, and the free end of the condenser tube may be pushed through the traversing handle.

- (b) Crawling : The man will lie on his right side, head to the front, weight of the body supported on the right elbow, right knee bent. He will support the gun with the barrel casing resting on the right forearm, the breech casing on the inside of the right thigh. He will grasp the left traversing handle with the left hand, which will also contain the free end of the condenser tube. He will crawl forward making use of his right elbow and left leg.

iii. Ammunition boxes and condenser can—

For short distances the maximum load for a man is one ammunition box and one condenser can, or two ammunition boxes. For longer distances :—

- (a) Walking or Doubling : One liner under each arm, and one liner or condenser can in one hand.
- (b) Crawling : Any convenient method may be adopted. A suggested method is that the handle of an ammunition box may be hung over the toe of the man's boot. By this method the man can crawl on his side with one ammunition box on one foot and with the condenser can in one hand.

iv. Two-man load—

NOTE.—The gun will be unloaded before the movement described below is carried out.

- (a) If it is required to move a gun and tripod, which have already been mounted, a short distance to a new position, the whole may be carried by two men as follows :—

No. 1, right hand on the rear leg, left hand, containing the condenser can, on the left front leg.

No. 2, left hand on the right front leg, ammunition box in the right hand.

- (b) The gun mounted on the tripod can be moved by two men crawling forward, each grasping a front leg.

2. Practise squad.

LESSON 58.—MOUNTING THE GUN ON EXPOSED GROUND.

Instructor's Note.

Stores :—

As for Lesson 57.

- 1. The instructor will explain to the men that the mounting taught to them during drills is not always the most suitable

under service conditions, owing to the necessity for concealment and the unevenness of the ground.

2. Explain and demonstrate:—

i. Mounting and dismounting the tripod—

To mount the tripod—

No. 1 crawls forward with the tripod, placing it over the spot indicated. Keeping as low as possible on the left of the tripod, with his head to the front, he loosens the jamming handles of the two front legs and opens them by rocking the tripod, first to one side and then to the other. He adjusts the rear leg so that when the tripod is mounted it will be at its minimum height.* He raises the tripod until the socket is upright and clamps up the front legs. It may be more convenient when mounting the tripod to adjust each front leg separately, rocking the tripod as described above.

An alternative method of mounting the tripod—

Before giving him the order "**Mount gun,**" the No. 1 will now be told to set the rear leg at an angle suitable for the selected gun position. In addition, the two front legs will swing forward and upward, clamped in a suitable position over the rear leg.

To dismount the tripod—

No. 1 will loosen the front and rear leg jamming handles, and adjust the rear leg to the sitting position. He will close the legs together and tighten up all jamming handles.

ii. Mounting and dismounting the gun and tripod—

To mount the gun—

No. 1 removes the elevating and crosshead joint pins. No. 2 opens the sliding shutter and crawls forward with the gun, timing himself to arrive at the position when No. 1 has prepared the tripod as described above. Together they will mount the gun on the tripod. (See Plate 9.) No. 1 will drive in the crosshead joint pin and turn the handle down; he will then swing round, keeping as low as possible, and will lie with his legs to the front, right leg

* In obtaining the minimum height, it will be found with most tripods that a firm mounting cannot be obtained by closing the rear leg right up to the socket. It will usually be necessary to adjust the rear leg back one tooth from the socket.



- i. Types of ground selected should include—
 - i. The side of a slope for firing in any direction.
 - ii. The top of a narrow bank, with the object of obtaining maximum command.
 - iii. The side of a bank, in order to clear the top or fire along it.
 - iv. A hedgerow, in order to fire through it.
 - v. A shell hole.
 - vi. Broken ground.
2. Explain and demonstrate :—
 - i. Mounting the gun and tripod by moving under cover to a gun position on uneven ground, and by adjusting all the legs.
 - ii. Dismounting the gun and tripod by dragging the mounting behind cover.
 - iii. Mounting the gun in rear and working forward with it mounted to the selected gun position.
3. Practise squad.

NOTE.—In examining each mounting the instructor will point out that the following conditions must be fulfilled :—

- i. The mounting must be as low as possible consistent with obtaining a view of the arc of fire or target.
- ii. The position of the rear leg is governed by the shape of the ground, irrespective of the direction in which the gun has to fire.
- iii. The socket must be mounted upright, and over the spot indicated.
- iv. The shoes only, and not the legs, must be bearing on the ground.
- v. The ground supporting each shoe must be sufficiently firm to ensure that the shoe does not slip during firing.
- vi. No part of the tripod must interfere with the elevating wheel.

LESSON 60.—BRINGING THE GUN INTO ACTION, AS PART OF A SECTION, MAKING USE OF COVER.

Instructor's Notes.

Stores :—

As for Lesson 57.

Equipment will be worn.

Explain and demonstrate :—

- (i) Explain that the object of this lesson is to practise bringing the gun into action with the minimum

PLATE II.

GUN MOUNTED TO FIRE DOWN A SLOPE.

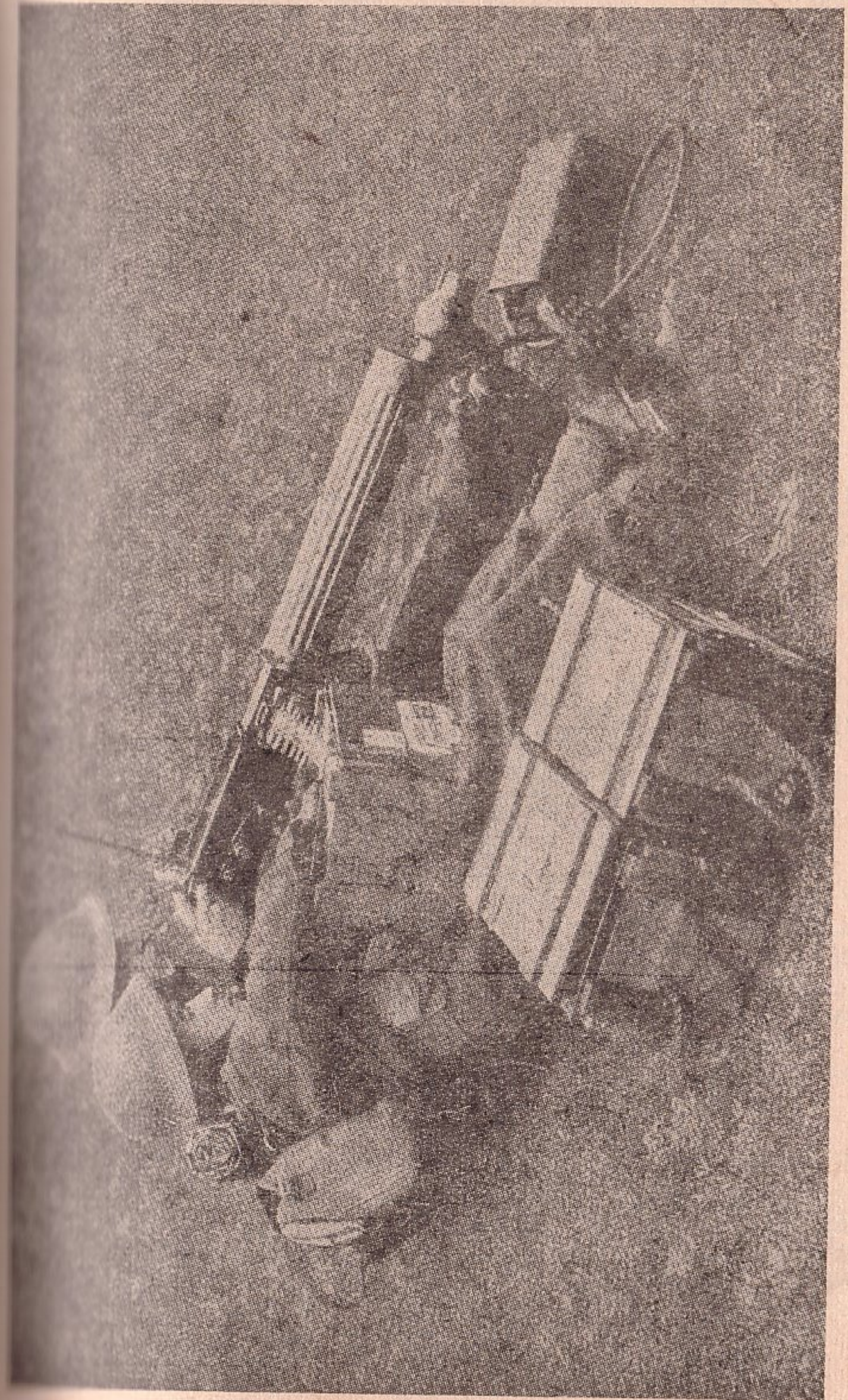
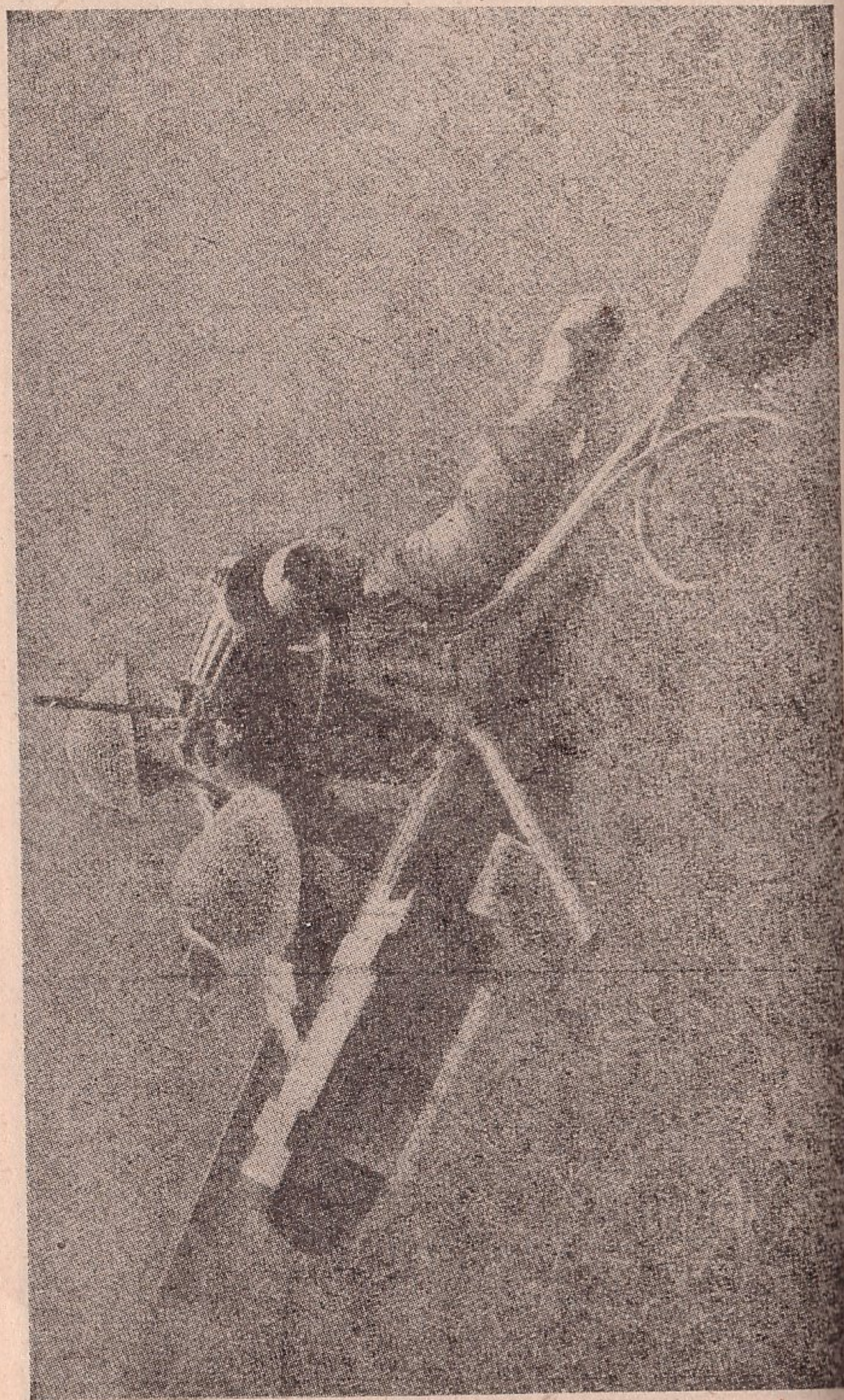


PLATE 12.

GUN MOUNTED ON THE SIDE OF A SLOPE.



exposure to enemy observation and maximum cover from fire. The importance of these points in training for war will be emphasized.

ii. Describe briefly the methods by which a section commander may bring his guns into action (Sec. 22).

iii. Explain the necessity for good team work between—
The section corporal in rear.

The gun numbers of the subsection.

The section commander and his orderly in front.

iv. Decide previously on—

(a) A target and/or arc of fire.

(b) One gun position from which to engage it.

(c) Ground from which the enemy can observe.

(d) A point close behind the gun position to which the subsection has been led under cover.

v. Assemble the gun numbers, with their stores, at this point behind the gun position. Explain the situation regarding enemy observation, &c., and then order them into action, using one of the methods in Sec. 22, detailing a man to act as section orderly if necessary.

vi. When the gun is in action, discuss the following:—

(a) Ability of the gun to do its task.

(b) Suitability of the mounting.

(c) Position of the stores at the gun.

(d) Position of No. 1 with regard to concealment and freedom of action.

(e) Position of No. 2 with regard to—
Concealment.

Observing signals from fire controller.

Attention to feed.

Assisting in immediate action.

(f) Positioning of remaining numbers with regard to concealment, all-round protection, and their duties in action.

(g) Method of mounting the gun without undue exposure.

(h) The move forward of the gun numbers with regard to concealment and time.

(i) Action of the section orderly (if used).

(j) How the gun position adopted could be improved by the use of camouflage or by digging.

vii. In this lesson, practice will be given in fire discipline (direct fire), the maintenance of the gun in action, and in the complete duties in the occupation of a gun position from the position in readiness (including a long carry).

SECTION 15.—VEHICLES.

LESSON 61.—LOADING TRUCKS.

It is not the intention that there should be any rigidity in the distribution of loads and personnel to vehicles. These may be modified to suit varying conditions.

The drills and field duties described in this pamphlet are based on the distribution of loads and personnel shown in this Section.

Instructor's Notes.

Stores: Three trucks. Complete stores of 1 section and platoon H.Q.

Lay out the stores in four groups as under:—

Group 1.—Platoon commander's truck.

„ 2.—Platoon sergeant's truck.

„ 3.—Odd subsection truck.

„ 4.—Even subsection truck.

1. Explain:—

(i) Platoon personnel are distributed as follows:—

Platoon headquarters—

Platoon commander's truck—Platoon commander.
2 rangetakers.
2 orderlies.
Batman.
Driver.

Platoon sergeant's truck—Platoon sergeant.
2 scouts (gun Nos.).
Driver.

Motor-cycle—Platoon orderly.

Each section—

Odd subsection truck—Section commander.
5 gun Nos.
Driver.

Even subsection truck—Section corporal.
5 gun Nos.
Driver.

2. Load each vehicle in turn (for details see Plates 13-18).
3. Practise squad.

4. Summary of tools carried in M.M.G. Coy.

	Picks.	Shovels.	Total. Picks.	Total. Shovels.
Company H.Q. truck ..	3	5	3	5
Platoon sergeant's truck ..	5	5	15	15
Subsection truck ..	2	2	24	24
			—	—
Total in M.G. company ..			42	44
			—	—

NOTE.—Each rangetaker and each No. 3 and No. 4 carries an entrenching tool.

5. Suggested methods of loading trucks are shown on subsequent plates.

The loads for the even subsection truck will be the same as are shown for the odd subsection truck less the following:—

Thompson sub-machine gun.

Rattle.

Aiming post.

Instrument box.

Night firing equipment.

Wire-cutters.

Case, cans, oil.

In addition a spare parts box and spare condenser can will be carried on each even subsection truck.

NOTE 1.—When boxes, instruments, are issued they will be carried in the platoon commander's truck and each section commander's truck. They will contain:—

*Platoon Commander's.**Section Commander's.*

Cases, batteries and bulbs 2

Cases, batteries and bulbs 2

Bulbs 2

Bulbs 2

Batteries 2

Batteries 2

Director in case.

Pins, crosshead joint .. 2

Plotter M.G.

Chains „ „ .. 2

Protractor resector in case.

Pins, elevating „ .. 2

Screw clamp, checking traverse.

Chains „ „ .. 2

Lamps, electric .. 2

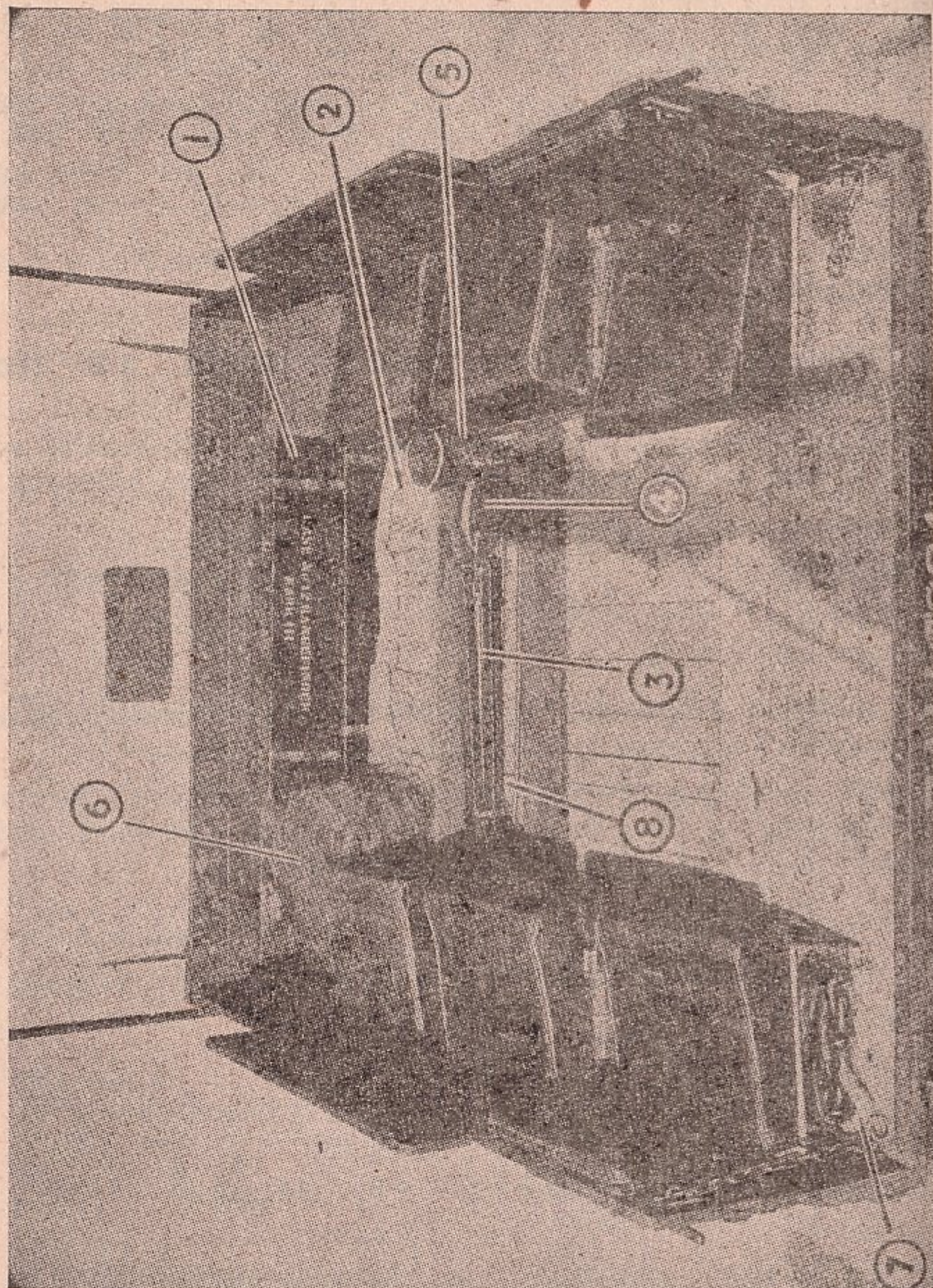
Lamps, electric, No. 1 2

Night firing pegs in case.

NOTE 2.—The Thompson sub-machine gun is not shown but will normally be with the section commander.

PLATE 13.

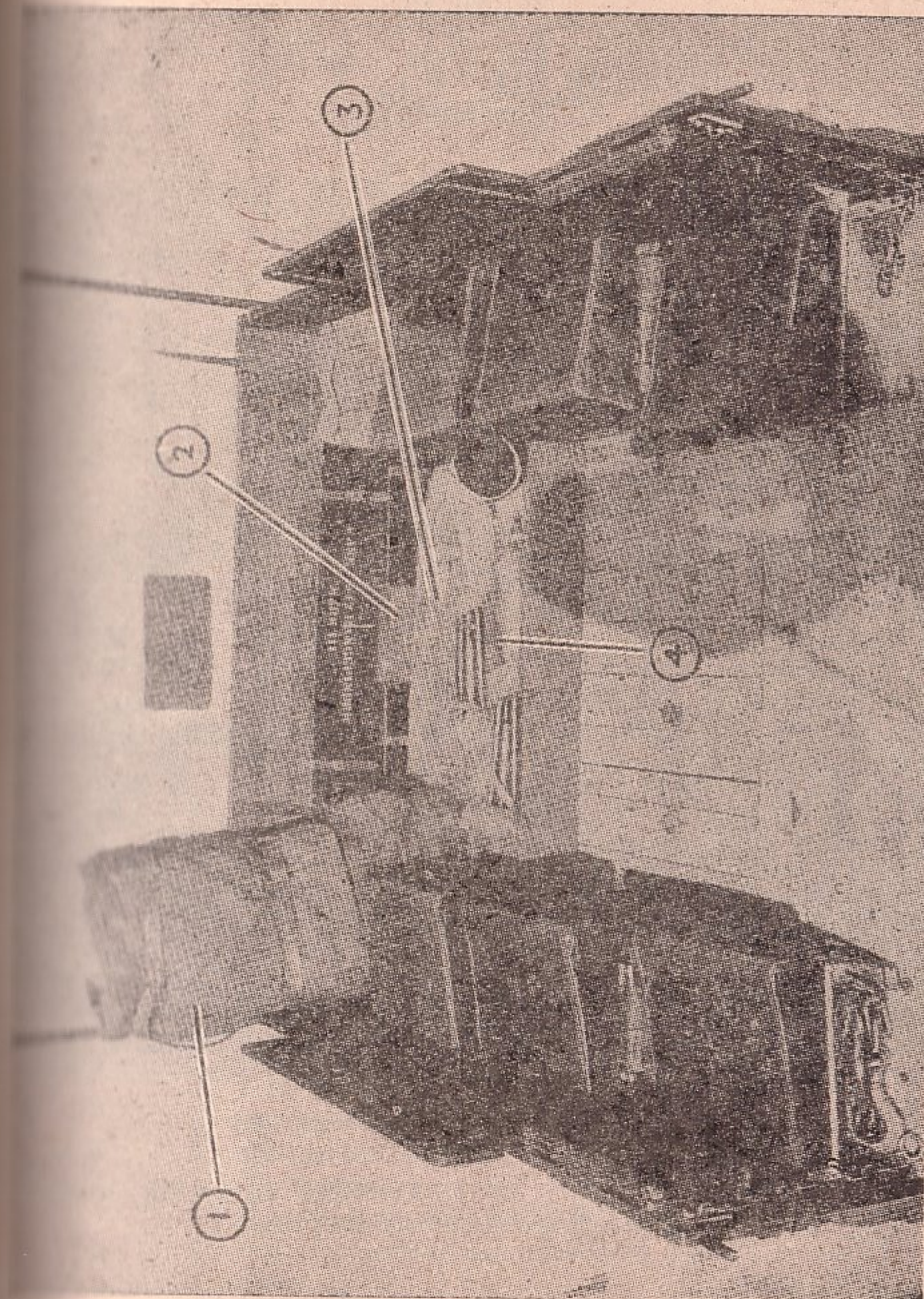
PLATOON COMMANDER'S TRUCK.
(Bottom layer.)



- | | |
|------------------------------|--------------------|
| 1. Rangefinder in boxes (2). | 5. Megaphone. |
| 2. Packs (6). | 6. Camouflage. |
| 3. Stands, director. | 7. Truck tow rope. |
| 4. Director. | 8. Zero posts (4). |

PLATE 14.

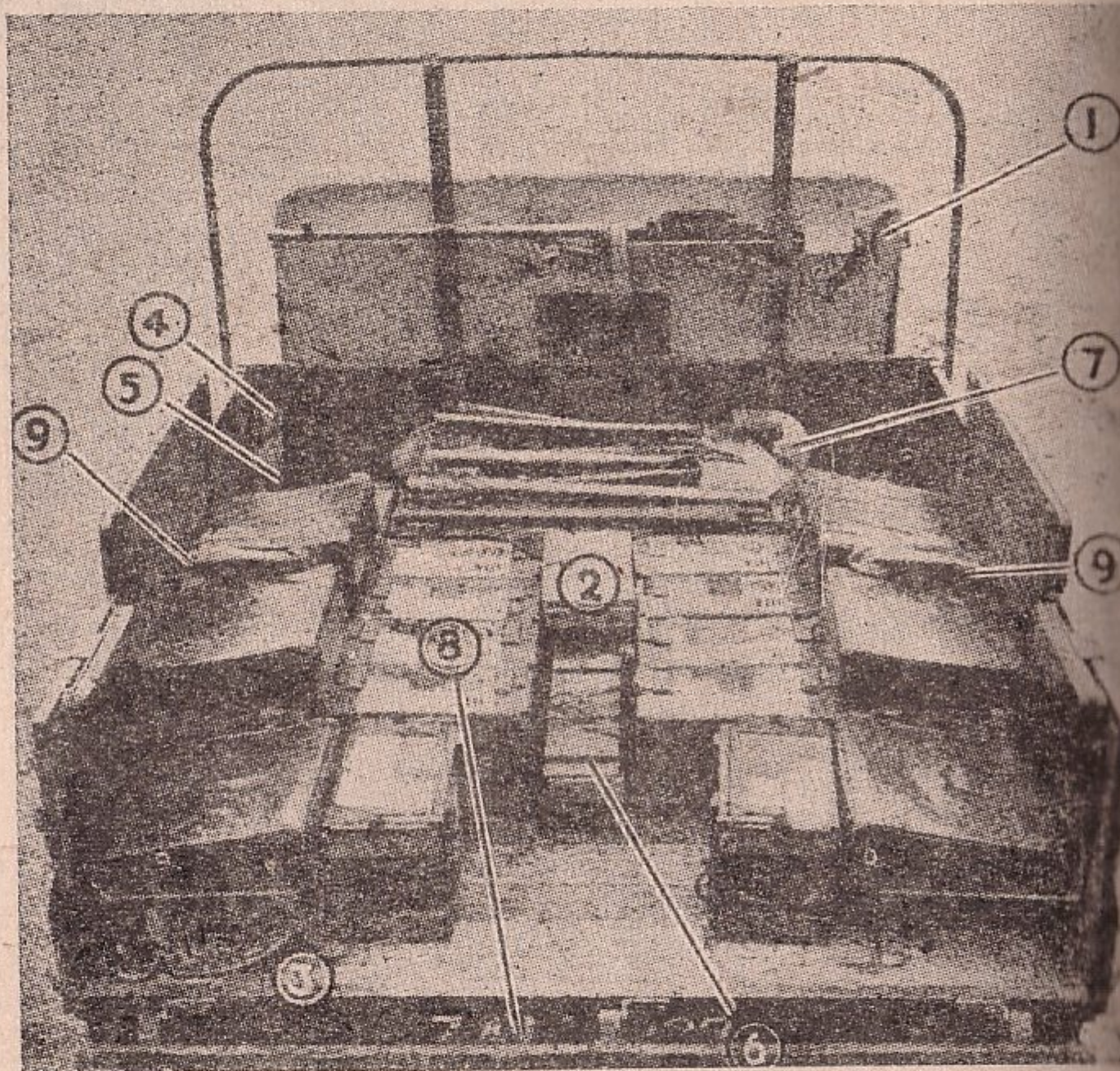
PLATOON COMMANDER'S TRUCK.
(Top layer.)



- | | |
|----------------------|---|
| 1. Officer's valise. | 3. Resector protractor. |
| 2. Plotter M.G. | 4. Cases, rangefinders and stands (2).
Rattle. |

PLATE 16.

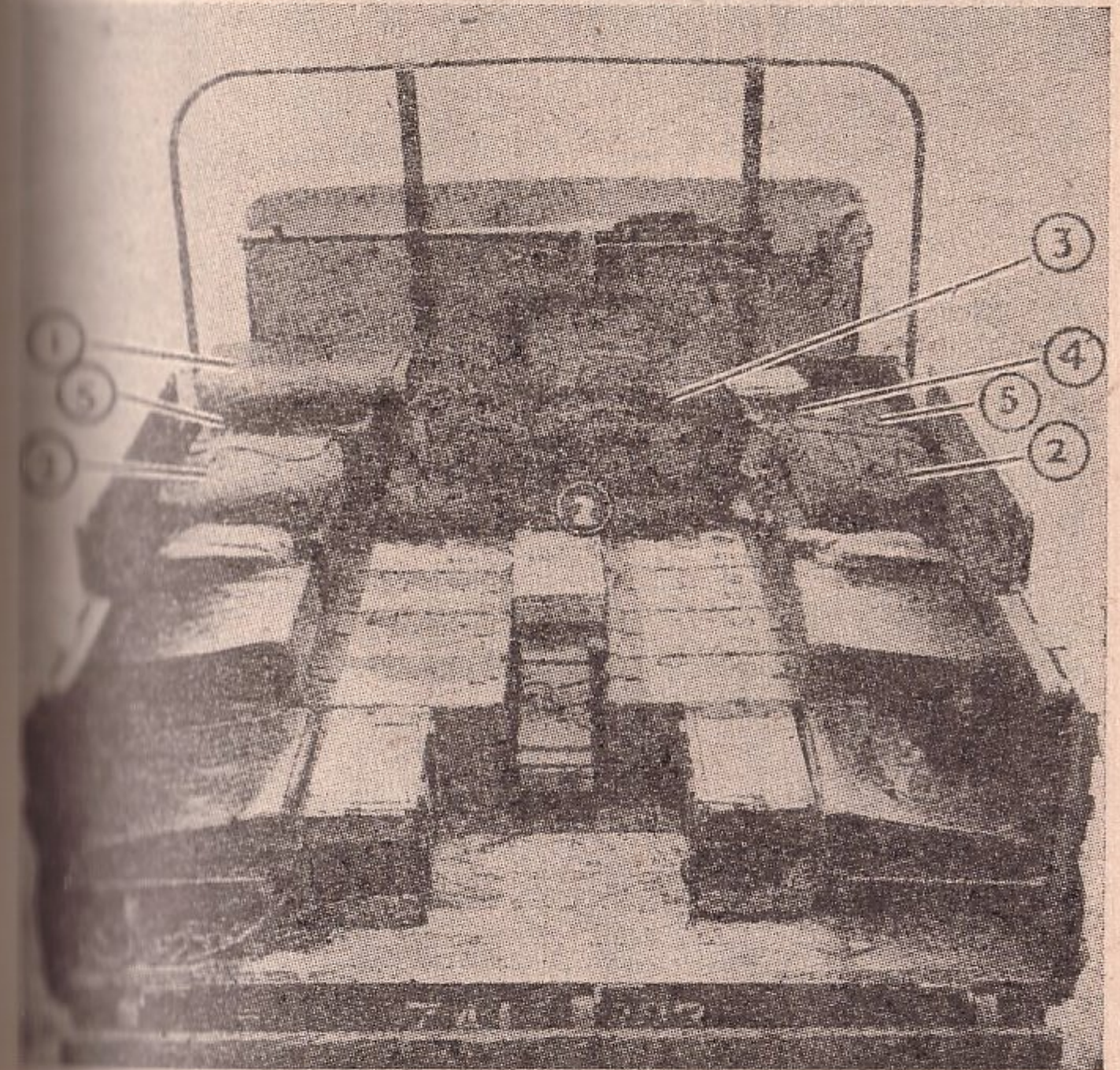
PLATOON SERGEANT'S TRUCK.
(Top layer.)



- | | |
|--|--------------------------------------|
| 1. Anti-tank rifle. | 5. Cases, cans, oil. |
| 2. One box .55 ammunition. | 6. One box grenades. |
| 3. Truck tow wire. | 7. Picks (5), shovels (5). |
| 4. Matchet. | 8. 17 boxes ammunition, Mark VIIIIZ. |
| 9. Four magazines for anti-tank rifle. | |

PLATE 15.

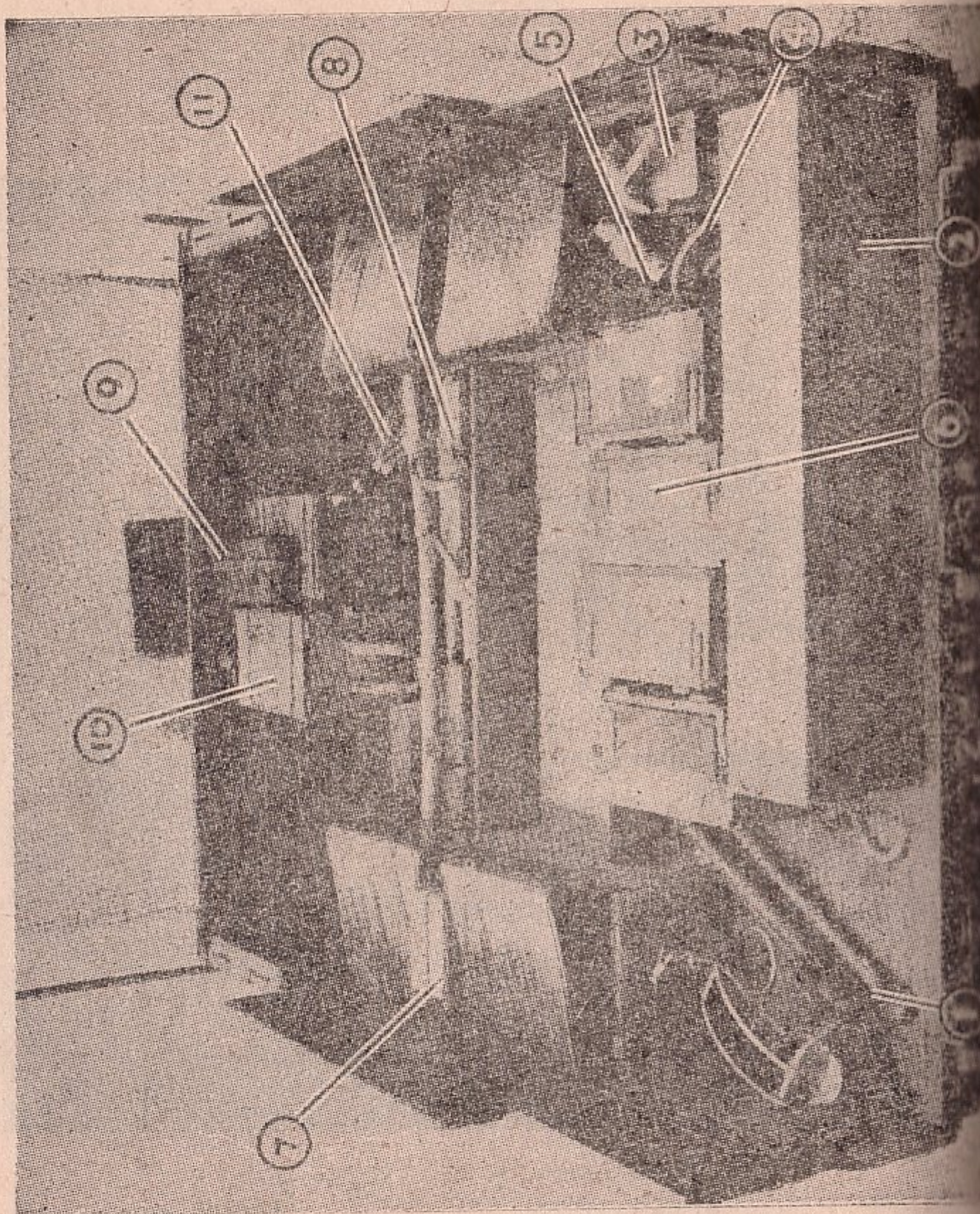
PLATOON SERGEANT'S TRUCK.
(Bottom layer.)



- | |
|---------------------------------------|
| 1. Truck cover. |
| 2. Packs (4). |
| 3. Camouflage nets (2). |
| 4. One tin bleach paste (28 lb.). |
| 5. Ammunition boxes, Mark VIIIIZ (3). |

PLATE 17.

ODD SUBSECTION TRUCK.
(Bottom layer.)

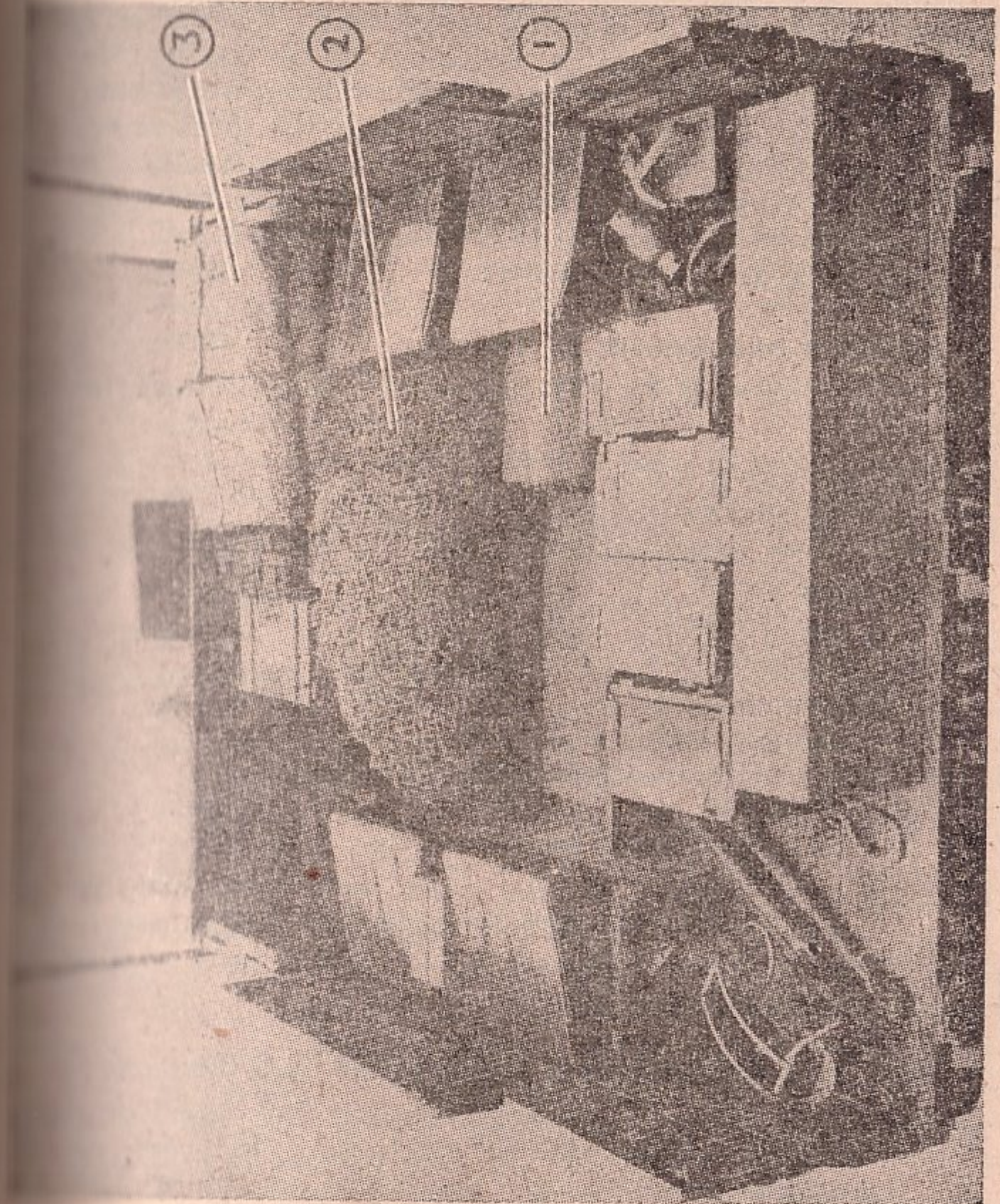


1. Tripod.
2. Gun chest.
3. Condenser can.
4. Condenser tube.
5. Spare parts case and blast deflector.
6. Ammunition boxes, Mark VIIIIZ (4).
7. Dial sight.
8. Picks (2), shovels (2).
One set night firing pegs.
Aiming post.
Old linen.

9. Cases, cans, oil.
10. Ammunition boxes, Mark VIIIIZ (3).
11. Metal belt boxes (2).
11. Torches (2).
M.G. cape and gloves.
Aiming lamp.
Matchet.
Wire-cutter.
Rattle.

PLATE 18.

ODD SUBSECTION TRUCK.
(Top layer.)



1. Truck cover.
2. Camouflage nets (3), and spider.
3. Packs (7).

SECTION 16.—VISUAL TRAINING.

1. The methods taught in S.A.T., Vol. I, Pamphlet No. 2, 1937, Lessons 1 to 11, must be the groundwork of the machine gunner's visual training.

Owing, however, to the fact that machine guns are fired at longer ranges than other small arms, and to the close grouping of the gun, even minor inaccuracies in indication and recognition may result in the target being missed altogether.

Further, it is often necessary to fire machine guns under conditions in which the safety of our own troops has to be considered, and in which any inaccuracy might endanger them.

For these reasons the methods taught in S.A.T., Vol. I, Pamphlet No. 2, are amplified here.

2. Sequence and System of Training.

The following will be the sequence of individual instruction:—

- i. Officers and N.C.O.s—
Visual training.
The organization of the arc, including the use of range cards.
Indication.
Fire orders.
- ii. Gun numbers—
Visual training.
Judging distance up to 1,000 yards.
Recognition.
Application of fire orders.
- iii. The rangetakers, scouts, and orderlies will require instruction in visual training, and elementary indication and recognition, on the same lines as that for officers and N.C.O.s.

3. Individual Instruction of Officers and N.C.O.s.

- i. Visual Training: Attention should be called to those features which are of particular interest to the machine gunner—*e.g.*, positions for observation to the front and to the flanks, positions that offer a good field of fire, areas on which observation of fire is likely to be obtained, localities from which enemy attacks may develop, the visibility of skyline, &c., By such practice a necessary introduction will be obtained to the more detailed study

of cover, reconnaissance, and the selection of gun positions.

Practice in the use of glasses should be combined with the above.

- (ii) The organization of the Arc and Use of Range Cards: Instruction should be given having regard to a tactical situation. Particular attention should be paid to the choice of reference points, to the orders to be given to the rangetaker, and to estimating ranges from the key ranges on a range card.
- (iii) Indication: The sequence of instruction will be as laid down in S.A.T., Vol. I, Pamphlet No. 2, the instructional stores and technical methods involved being adapted to machine gun requirements. For example, directors will be used instead of aiming rests.
- (iv) Fire Orders: As soon as a satisfactory standard of indication has been reached, officers and N.C.O.s will be practised in giving out fire orders for various targets. Landscape targets may be used in the preliminary stages. Examples of direct fire orders will be found in Part III, Sec. 24.
During the later stages of training the time taken to give out the fire order will be noted, and when necessary, it will be pointed out where time could be saved. This factor will be of particular importance in the engagement of moving targets.
The detail of fire discipline in connection with fire orders is practised in Section drill—Direct fire (Sec. 17, Lesson 68).

Individual Instruction of Gun Numbers.

- i. Visual training: As in S.A.T., Vol. I, Pamphlet No. 2, extended to suit machine gun requirements.
- ii. Judging Distance up to 1,000 Yards: The men will be taught to judge distances up to 1,000 yards. The method and sequence of instruction will be as laid down in S.A.T. Vol. I, Pamphlet No. 2.
- iii. Recognition: Instruction in recognition must only be given by N.C.O.s who have reached a high standard in indication.
The sequence of instruction will be as laid down in S.A.T., Vol. I, Pamphlet No. 2, landscape targets or the miniature range being used in the preliminary stages.

During this instruction the Nos. 1 will be at the guns, and on the conclusion of the indication will be ordered to lay on the point of aim indicated. The instructor will check the point of aim. Not more than four guns should be used at one time by one instructor.

- iv. Fire Orders: As soon as a satisfactory standard of recognition has been reached, the men will be practised individually in the detail of applying fire orders to the gun.

NOTE.—It cannot be stressed too strongly that the best method of getting guns on to a target is for the section commander to lay them himself. When this method is impracticable some other method must, of course, be adopted.

LESSON 62.—INDICATION AND RECOGNITION (WITHOUT AIDS).

Instructor's Note.

Stores :—

Gun, tripod, landscape target, directors. The landscape target can be used, but every opportunity should be taken of practising on the ground.

1. **The Arc of Fire.**—Explain that the area of ground to be watched, and within which targets will be engaged, is known as the arc of fire.

The arc is bounded by the "right of arc" and "left of arc," each limit being an imaginary line passing through the gun position and some easily described point on the landscape in the direction required. Similarly, an imaginary line, known as the "near limit of arc," can be described from right to left across the area, to indicate that only the ground beyond this line, and within the limits mentioned above, need be considered.

2. Demonstrate how, whenever possible, the gun itself will be laid on to the point to be recognized. This is the simplest and most direct method of indication.

Explain how an instrument—for example, a director or "pointer"—can also be used.

Explain that the approximate right, centre, or left of arc can be of great assistance to denote a general direction, viz.:

"Right of arc—White house," "Centre of arc—Bright yellow patch."

3. Practise the squad in indication (officers and N.C.O.s only) and recognition by the above means, insisting on an accurate aim every time the gun is laid.

LESSON 63.—INDICATION AND RECOGNITION (WITH AIDS).

Instructor's Notes.

Stores :—

Gun, tripod, graticuled glasses, slide rule, degree scale painted on the wall. Directors.

Use a landscape target, if necessary, but preferably practise on the ground.

REFERENCE POINTS.

1. Explain that—

- i. Reference points in a machine gun arc may be as far apart as 30 degrees.

In deciding on the number of reference points, the objects to be employed, and their distance apart and from the guns, the fire controller must consider the nature of the arc of fire and his task. As a general rule, as few reference points as possible should be used, in order to avoid confusion.

- ii. They should be in the areas where targets may be expected to appear. When the enemy is tied to definite lines of approach, or moving targets are likely, it may be necessary to choose a few reference points close together to facilitate rapid switching.

- iii. The points originally used for describing the right or left of arc should not be employed as reference points, unless specially named as such.

2. Practise (officers and N.C.O.s only) in the selection of reference points in accordance with the above considerations.

DEGREE MEASUREMENT.

3. The squad must first know their own hand angles (S.A.T., Vol. I, Pamphlet No. 2, 1937, Lesson 7).

4. Explain that—

When it is necessary to give out angles the following form will be followed :—

4° 35'—Four degrees three five minutes.

12° 5'—One two degrees five minutes.

10° 20'—One owe degrees two owe minutes.*

The words "right" or "left" or "elevation" or "depression" will precede the number of degrees or minutes, when required.

* In all examples this form of phonetic spelling is used to represent the figures "0."

i. Fire controllers should measure horizontal and vertical angles by means of the graticules in their field glasses or slide rule. If for any other reason it is necessary for them to use hand angles, it should be remembered that they will normally be in the lying position. Therefore, when their individual hand angles are being determined, these should also be checked lying down.

ii. At the gun, degrees included in an indication will normally be measured by hand angles.

iii. If it is impossible to indicate the target by other means the fire controller may order vertical and horizontal angles to be measured by means of the elevating handwheel or gun dial or both.

The following methods may be employed :—

(a) *Using the Handwheel only.*—To be employed when there is a prominent mark directly in line with the target, but above or below it.

The section commander orders the range or ranges required to hit the target, and indicates the prominent mark for the guns to lay on.

He then gives the order "**Handwheel**" on which Nos. 1 lay on the mark named.

With his glasses or slide rule, the section commander measures the difference in angle of sight between the prominent mark and the target.

He orders Nos. 1 to elevate or depress the guns by means of the elevating handwheel through this amount.

The order will be given in the form "**All—up (or down) deg. . . . mins.**" He then orders :—
"**Realign sights on**"

Nos. 1 realign their line of sight on the prominent mark by moving the tangent sight slide. The mark is then used as an auxiliary aiming mark.

(b) *Using the dial and Handwheel (if required).*—To be employed when there is no mark directly in line with the target.

The section commander chooses a suitable mark as close to the target as possible.

He measures with graticules the horizontal angular amount by which the target is right or left of the mark, and the vertical amount by which the target is above or below the horizontal line through the mark.

He gives out the range or ranges to hit the target, indicates the mark, and orders "**Dials.**"

i. Nos. 1 adjust their sight to the range and lay on the mark. Nos. 2 set the dials at zero.

The section commander orders :—

"**All—right (or left) deg. . . . mins.**"

"**All—up (or down) deg. . . . mins.**"

The guns are moved through the angles ordered by the use of the dials and elevating handwheel respectively.

The section commander then orders an actual point of aim—e.g., "**patch of brown grass.**"

ii. If units have tripods without dials :—

On the command "**Dials**"—

Nos. 1 will lay on the point indicated.

They will affix their dial sights and adjust collimators on that point. Lateral angles will be laid off by means of the deflection drum, and elevation obtained by means of the handwheel.

5. The class will practise, officers and N.C.O.s indicating targets by the methods in para. 4 above; the men will practise recognition by these means alone, and laying the gun as ordered.

Combination of vertical clock ray and degree-measurement will also be practised.

6. Explain that—

i. The indication of the ends of a target with width requires particular attention.

ii. The insertion of the word "**from**" before the description of one end of the target and "**to**" before the description of the other will normally suffice to indicate the limits of the targets.

Example :—

"**Centre of arc — bush—from bush to right — five o'clock—three degrees—tree.**"

If the indication is difficult, this method of wording may not always be possible, and the words "**from**" and "**to**" would have to be used as in the following example :—

"**Centre of arc — house—left, small bush — left, gap in hedgegrow — left 7 o'clock — faint dark mark—from bush to mark.**"

In such an indication, to avoid misunderstanding, the words "**right limit**" and "**left limit**" may be used to indicate the flanks. The above example would then be:—

"Centre of arc—house—left, 9 o'clock—small bush—right limit—left—9 o'clock—gap in hedgerow—left 7 o'clock—faint dark mark—left limit."

7. The class will practise as in para. 5 above.

LESSON 64.—DIRECT FIRE ORDERS FOR GUN NUMBERS.

Instructor's Note.

Stores :—

Two guns, tripods, belts and ammunition boxes, dummy cartridges, and, if no open country is available, landscape target. Field glasses or slide rule.

i. Explain and demonstrate :—

- i. Point of aim, according to method of fire.
- ii. Overlap at ends of targets and of beaten zones in centre of oblique targets, having a different range to each end.
- iii. Wind allowance and its effect on the point of aim before and during firing.
- iv. Length of bursts.
- v. Rate of fire.
- vi. Action of No. 1 on the command "**Stop.**"

2. Take examples of all types of targets, including moving targets, using various methods of indication.

During the indication of targets No. 2 will always watch the front and follow the indication.

JUDGING DISTANCE TEST.

1. The test as laid down in S.A.T., Vol. I, Pamphlet No. 2, 1937, Sec. 3, will be carried out by recruits at their depots.

2. Personnel of M.G. companies will carry out two tests annually.

The instructions for the conduct of tests contained in Pamphlet No. 2 will in general be followed with certain modifications as under :—

- i. *Objects.*—If possible all objects will be natural. Otherwise artificial targets such as camouflage screens, &c., may be substituted.

ii. Distances :—

- (a) Gun numbers will judge on two objects both under 1,000 yards, and not nearer than 600 yards. They will estimate one range to an object not more than 1,000 yards away and a reasonable distance from a known range.
- (b) Subaltern officers, N.C.O.s, and selected privates will carry out the test for gun numbers, and in addition will estimate the ranges to two objects not farther than 2,000 yards away and within a reasonable distance of two known ranges.

iii. Standards of efficiency :—

- (a) For judging as in Pamphlet No. 2.

For estimating—

Up to 1,500 yards permissible error 50 yards.

From 1,500 to 2,000 yards permissible error 100 yards.

NOTE.—Known ranges from which estimations are required will be given to the nearest yard.

The ranges to objects which are to be estimated will be noted to the nearest 50 yards below or above. Those being tested will be given the benefit of the doubt in assessing their standard of efficiency—*e.g.*, a range of 1387 will be considered as 1350 or 1400, and ranges given as 1300 and 1450 accepted as passing.

- (b) In order to pass, gun numbers must be correct within permissible error in two of the ranges; subaltern officers, N.C.O.s, and selected privates in four ranges.
- (c) Personnel who are tested will either "**qualify**" or "**fail.**" To "**qualify**" it will be necessary to pass **both tests**. An individual who does not attend any test will be graded as "**not exercised.**"

iv. Double forward to a suitable position a few paces to the right of Nos. 1.

Nos. 3.—Take the condenser can and one ammunition box. No. 3 of the odd subsection takes the aiming post and double forward to a suitable position in rear of Nos. 1 and 2.

Nos. 4.—Remove ammunition boxes not taken by Nos. 1 up to number ordered, take them forward to Nos. 3, return to a central position in rear and await orders from the section corporal.

Section Commander—

The section commander indicates places where guns are to be mounted and the direction in which they will point.

“Action.”

Nos. 1, 2, and 3.—Will mount gun on the spot indicated in accordance with the detail for action in elementary gun drill. No. 3 will make the necessary journeys to place ammunition at the gun.

Section Corporal.—As soon as the situation permits after the guns are in action, he will report to the section commander for information and orders. In addition, he must as soon as possible organize his chain of supply. He will himself take up a position from which he can best supervise the work behind the gun position.

LESSON 66.—CEASE FIRING AND ON TRUCKS.

Section Commander signals trucks. When section corporal acknowledges, section commander orders **“Cease firing.”**

(If aiming post has been put out, the section commander must first give the orders **“Unload,” “Clear guns,” “Remove dial sights.”**)

Section Commander.—**“Cease firing.”**

Drivers—

- i. Drive their trucks to the position previously ordered and lower tailboards.
- ii. Place gun chests on ground and open lids.

Nos. 1, 2, and 3.—Will cease firing as in elementary gun drill. Nos. 3 make as many journeys as necessary to remove the condenser cans and all ammunition boxes from the gun position. No. 3 of the odd subsection will first bring in the aiming post, if in use.

Nos. 4.—Take up a position just in rear of Nos. 3.

Section Commander.—“On truck.”

Nos. 1.—Replace their tripods and dial sights in the trucks.

Nos. 2—

- i. Return to trucks and remove condenser-tubes and blast deflectors.
- ii. Replace guns, fasten chests, and, assisted by drivers, put chests on trucks.
- iii. Return condenser-tubes, spare parts cases, and blast deflectors to their correct positions.

Nos. 3.—Return condenser cans, and as many ammunition boxes as they can carry, to their correct positions. No. 3 of the odd subsection returns aiming post.

Nos. 4.—Return all ammunition boxes left behind by Nos. 3. No. 4 of the odd subsection will return the aiming post, if in use, on his first journey.

Drivers.—Assisted by Nos. 2, replace gun chests, and when all numbers are on the trucks, fasten the tailboards.

NOTE.—On completion of their duties all numbers will resume their positions in the trucks. The section commander and section corporal will supervise the action at their own trucks.

The section corporal will ensure that the spare parts box, if removed from the truck, is returned by one of the higher numbers.

LESSON 67.—LONG CARRY.

Instructor's Notes.

Additional stores:—

Extra ammunition boxes.

When the gun position is an appreciable distance from the position in readiness, the section corporal will detail loads sently throughout the section. Nos. 4 and 5 will return for any ammunition boxes which cannot be carried in the first journey. At the end of the carry all ammunition boxes will be placed with No. 3.

LESSON 68.—FIRE DISCIPLINE.

Instructor's Notes.

Additional stores:—

Landscape target, if necessary.

Before carrying out this stage of the drill the man must have sufficient instruction in receiving fire orders.

Nos. 1 set the range (from the tangent sight) on the range drum, and then level the bubble by means of the angle of sight drum.

Section Commander—

“Unload” — “Clear guns” — “Out aiming lamp.”

Nos. 1 close **rear covers**. No. 3 of the odd subsection will put out the aiming post centrally in front of the two guns, place on the aiming lamp, secure the box, attach the line to the switch, and bring the reel back to the section commander.

Nos. 1.—Align the collimator on the lamp.

Section commander orders—

“Load” and **“Fire”** as required.

INDIRECT FIRE.

Nos. 1 relay on the aiming post, and after No. 3 has attached the lamp, &c., as for direct fire, Nos. 1 align the collimator on the aiming lamp.

***LESSON 72.—TO CHANGE FROM NIGHT FIRING TO DIRECT FIRE.**

Section Commander—

“Prepare for direct fire” — “Unload” — “Clear guns” — “In aiming lamp.”

Nos. 1 remove the dial sights.

No. 3 of the odd subsection moves out, replaces the lamp in the box, and brings in box and aiming post. He collects the reel from the section commander and rewinds the line, replacing it in the box. He collects the torches from the section commander and section corporal, and replaces them, with the aiming lamp, in a place of safety, until an opportunity occurs for them to be returned to the trucks.

NOTE.—To change from night firing to indirect fire:—

Nos. 1 check their aim on the aiming lamp.

No. 3 of the odd subsection acts as for direct fire, except that the aiming post is left out.

Nos. 1 realign collimator on the aiming post.

* Units equipped with Mark II aiming lamps, see Lesson 72, Appendix IV.

SECTION 18.—PLATOON DRILL—INDIRECT.

Instructor's Notes.

SAFETY PRECAUTIONS WILL BE CARRIED OUT BEFORE DRILL BEGINS.

1. *Signals.*—The required signals must be taught before proceeding with platoon drill, indirect (see Sec. 13).

2. *As proficiency is attained, the drill will be practised, making use of cover as in section drill, direct fire.*

3. *Stores required.*—Each section as for section drill, direct fire.

4. *The object of platoon drill, indirect, is to teach and exercise the platoon personnel in their drill duties as a fire unit employing indirect fire.*

5. *In the detail of the drills the junior section commander repeats the angles when the guns are being placed on the original zero lines. It must be understood that he may be instructed to repeat other angles—e.g., elevations, distribution angles, &c.—at the discretion of the fire controller.*

In addition, section commanders are responsible that the angles, elevations, &c., are applied to the guns correctly, if necessary checking the work of the Nos. 1 themselves.

6. *Beginning of Drill.*—Before the drill begins the instructor will fall the platoon in, detail off sections as in section drill, direct fire. Before the order “Take post” the instructor will inform the senior section corporal where the trucks are to be sent when the required stores have been removed and reported correct. (For drill purposes this need only be a short distance in rear.)

LESSON 73.—PREPARE FOR ACTION.

Instructor's Note.

Additional stores:—

Four subsection trucks and a megaphone.

On the order **“Take post”** the senior section commander will double forward to the gun position, placing himself on that flank which will be nearest to the platoon O.P., from which position he is responsible for the general duties on the gun position.

Junior Section Commander—

“.... belts—for indirect fire—prepare for action.”

The junior section commander will position himself midway and in front of the platoon, and supervise in general the

prepare for action. Both section corporals will supervise the work at their own trucks, finally joining their Nos. 4.

The action of each section will be as in section drill, direct fire.

Subsections will be positioned by the junior section commander. When the stores have been removed from the trucks, and have been inspected and reported correct, the senior section corporal will:—

- (1) Send Nos. 4 to join the trucks.
- (2) Send the trucks to the position ordered.
- (3) Place himself and the junior section corporal in the most suitable position from which they can supervise the communication between guns and trucks.

If a long carry is necessary, the same procedure as in section drill, direct fire, will be adopted, except that the junior section commander will detail loads.

LESSON 74.—TO COME INTO ACTION.

Senior section commander orders forward junior section commander and gives the following orders:—

Method of paralleling (position of director, if necessary, pivot gun, if any, gun position, frontage and direction.

Senior Section Commander—

“ Junior Section Commander.”

Junior section commander doubles forward and receives orders, as above, from the senior section commander, doubles away to the opposite flank of the gun position, kneels down, and faces inwards.

Senior Section Commander—

“ For indirect fire—mount gun.”

Both section commanders will supervise the arrival of Nos. 1 of the nearest section, ensuring that the inner gun is the correct distance from him, and staggered.

Nos. 1.—Double forward, mount their tripods on the positions as directed by the section commander. They stamp in the shoes of their tripods before sitting down. When the gun is mounted they will affix the dial sight and test the clamp.

Nos. 2.—Having mounted their guns, will take post as for direct fire.

Nos. 3.—Carry out their duties as in section drill, direct fire, finally taking up a position a short distance in rear of their guns.

Nos. 3 of the odd subsections put out the aiming posts centrally between the two guns of their section.

LESSON 75.—CEASE FIRING AND ON TRUCKS.

Instructor's Note.

Additional stores:—

As this heading is taught immediately after “ To come into action ” it will first be necessary to have guns loaded in order that cease firing may be carried out correctly.

Fire Controller signals—

“ Cease firing.”

Senior section commander acknowledges the signal. He then signals for **“ Trucks.”**

Senior Section Commander.—**“ Unload — Clear guns ”**
“ Remove dial sights ”—“ Cease firing.”

The movement will be carried out as in section drill, direct fire.

Senior Section Commander—

“ On trucks.”

Each section will act as in “ On trucks ” in section drill, direct fire.

To parallel the Guns.

Section commanders will acknowledge all verbal orders by raising their hand. They will repeat orders when necessary, and keep their hand raised if a repetition is required.

The guns are paralleled by one of the methods described in Part III, Sec. 25.

LESSON 76.—DIRECTOR METHOD.

Instructor's Notes.

Additional stores:—

One director.

This method should be practised, using the director in different positions in relation to the guns.

Junior Section Commander.—On designation of the first gun to receive its zero line, he will take up a position behind that gun. As each gun receives its zero line he will repeat the angle to the fire controller. He will then proceed along and in rear of the guns, checking each gun in turn for parallelism.

To check for parallelism he will kneel behind each gun and glance along each barrel casing. If there is a distant crest in

front of the guns, the lines of fire of the four guns should be on approximately the same point. If there is a near crest, he will see where the line of fire of one gun crosses the crest in front, and will make his own approximation from this as to where the others should cross right or left of it. He will report immediately to the senior section commander should any gun not appear to be parallel.

Fire Controller—

"Zero lines."

No. 1.—Right (or Left) degrees minutes.

No. 2. " " "

No. 3 " " "

No. 4. " " "

Nos. 1 will place the angle ordered, on the dial and deflection drums, and lay on the director. They will then re-zero the dial and deflection drums and adjust the collimator on to the aiming post.

Nos. 2 will set the tripod dial at zero.

LESSON 77.—POST METHOD.

Instructor's Note.

Additional stores :—

Two zero posts.

The senior section commander marks the position (with reference to the posts) over which the pivot gun will be mounted.

On the order "**For indirect fire—mount gun**" the **Nos. 1** and **2** of the pivot gun align the gun on the posts, moving the tripod right or left until the line of sight through the collimator is in exact alignment of the posts. When this alignment has been checked by the senior section commander, **Nos. 1** and **2** stamp in the tripod, the senior section commander rechecks the line of sight, and ensures that the dial and deflection drums are set at zero.

Senior Section Commander.—Lays the dial sight at the collimator of each gun in turn, reading the angle from the front pointer of the dial and deflection drum.

Junior Section Commander.—Takes up his position behind the gun farthest from the pivot gun, repeats the angle to the senior section commander, and checks for parallelism as in director method.

Senior Section Commander—

"Zero lines."

No. —Right (or Left) degrees minutes.

No. " " "

No. " " "

Nos. 1 on receipt of the angle, set that angle on the dial sight and lay on the collimator of the pivot gun. When laid they will reset the dial sight at **zero**. **No. 1** of the pivot gun will be ordered to re-zero his dial sight.

The senior section commander checks the aim and dial (using the angle). **Nos. 1** will adjust the collimator on to the aiming post.

Nos. 2 will set the tripod dial at zero.

Senior Section Commander reports to fire controller—

"Guns on zero lines."

No. 3 of the pivot gun brings in the fire controller's posts.

LESSON 78.—COMBINATION OF DISTANT AIMING POINT AND POSTS (OR TARGET).

Instructor's Notes.

Additional stores :—

Two posts and director.

The fire controller will be responsible that either he or the senior section commander selects the distant aiming point.

The senior section commander will include the indication of the distant aiming point in his orders to the junior section commander.

The angle between the distant aiming point and the posts will be measured in either of the following two ways :—

Distant Aiming Point and Posts. (Angle measured by Dial Sight.)

Senior Section Commander—

"For indirect fire—mount gun."

Guns are mounted and pivot gun aligned as in post method. The senior section commander checks the alignment, the post legs are stamped in, and the alignment is rechecked. He then measures the angle distant aiming point and posts, using the dial sight.

Junior Section Commander—

"Zero lines — All right (or left) degrees minutes."

The junior section commander repeats the angle. Nos. 1 set the dial sight at the angle ordered. Section commander will check the setting on the dial sights and lay the guns of section nearest to them on the distant aiming point, using dial sight. Nos. 1 will then zero the dial sight and align collimator on the aiming post.

Nos. 2 will set the tripod dial at zero.

Junior section commander will check for parallelism at director method.

Senior Section Commander reports to fire controller "Guns on zero lines."

No. 3 of the pivot gun brings in the zero posts.

2. Distant Aiming Point and Posts (or Target).
(Angle measured by director.) Lesson III (2).

Guns are mounted as in Lesson 74, with the pivot gun as close as possible to the point from which the angle was measured.

Remainder of the drill as detailed in 1 above, from order "Zero lines."

LESSON 79.—T.O.G. METHOD.

Instructor's Note.

Additional stores :—

A director.

Guns will be mounted as for director method. The switch of the pivot gun will be put on the dial sight and the gun tapped over until the collimator is on the director.

The remaining guns will be paralleled as in the post method.

The senior section commander will close the angle by setting the original angle of switch on the dial sight of the pivot gun and by checking back the aim on the director.

No. 1 will zero his dial sight and readjust his collimator to the aiming post.

The senior section commander then reports to the controller, "Guns on zero lines."

LESSON 80.—TO PLACE THE NECESSARY ELEVATION ON THE GUN.

Fire Controller—

"No. (or all) Hundred (or Fifty)
(or Minus) degrees minutes."

or
"Elevation (or depression) No. (or all)
degrees minutes."

Nos. 1 act as taught in use of instruments.

To check Crest Clearance.

i. Near Crest :—

When the gun has been laid for elevation (or depression) Nos. 1 set their tangent sights at 400 yards, and see that the line of sight over the gun foresight clears the crest. If it does not, they report to the section commander "No. gun does not clear crest."

ii. Distant Crest :—

Senior Section Commander—

"Check for crest clearance with sights at"

(For method of obtaining this range see Sec. 25, Lesson 115.)

No. 1 sets the tangent sight at the graduation ordered and proceeds as in i, above.

Junior Section Commander.—Reports fire controller "Guns ready to load," and also reports any gun which does not clear crest.

Fire Controller—

"Load."

LESSON 81.—DISTRIBUTION AND CORRECTIONS.

Fire Controller—

"Distribution."

No. Nil.

No. —Right (or left) degrees minutes.

No. " " "

No. " " "

No. 1.—Set the deflection drum to the angle ordered, tap gun across until the collimator is on the aiming post. He assures that the bubble is central, using the handwheel. Then he will centralize it and realign the collimator on to the aiming post.)

Fire Controller—

"Right and left taps."

"Right and left taps."

When this order has been received, Nos. 2 indicate guns to fire. When all guns are ready, section commanders report to fire controller.

The right section will tap first to the left, and the left section will tap first to the right, by the amount ordered.

To make Allowance for Side Winds.**Fire Controller—****"Wind right (or left) degrees minutes."**

Nos. 1 make the necessary adjustment on the deflection drum, and tap their guns over until the lines of sight are on the aiming posts.

Nos. 2 act as in section drill, direct fire.

As soon as guns are relaid **Nos. 2** and section commander will indicate guns ready to fire.

Fire Controller signals or orders—**"Fire."****Section Commanders** and **Nos. 2** lower their hands.**Nos. 2** order fire if necessary.**Nos. 1** fire.**Fire Controller** signals—**"Stop."****Section Commanders—Repeat.****Nos. 2** repeat "Stop."**Nos. 1** stop.**Corrections during firing.**

NOTE.—Any correction during firing, signalled by the controller, must first be repeated by the senior section commander, before being given verbally to the guns.

i. Direction :—**Fire Controller—****"Stop"—"All right (or left) degrees minutes"—"Go on."**

Nos. 1 act as taught in controlled corrections—direct, elementary gun drill.

ii. Elevation :—**Fire Controller—****"Stop"—All up (or down) Hundred Fifty)—"Go on"****"Stop"—All up (or down) min."—"Go on."**

Nos. 1 act as taught in "controlled corrections—indirect" (if the correction ordered is down, they will recheck for crest clearance).

LESSON 82.—TO ENGAGE A NEW TARGET.**Fire Controller—****"Stop. All on zero lines."**

Nos. 1 set their dials and deflection drums at zero and relay on the aiming posts.

Nos. 2 check the tripod dial to see that it is at zero.

Fire Controller—**"All right (or left) degrees minutes."**

Nos. 1 set their dial sights to the angle ordered and relay on the aiming posts.

Fire Controller.—Orders elevation as in Lesson 80.**Nos. 1** perform their duties as in Lesson 80.**LESSON 83.—FIRE CONTROL CHARTS.***Instructor's Note.**Additional stores :—**Four fire control charts, four watches.*

This drill is based on the assumption that all N.C.O.s have been informed that the fire will be controlled by fire control charts.

The guns are placed on zero lines by any method previously taught.

When guns are paralleled the fire controller calls for section commanders and section corporals, and issues the fire control charts.

Section commanders and section corporals take post at their guns.

Fire Controller—**"Load."****"Prepare for Task 1."**

The N.C.O. at each gun will issue orders to the No. 1 in accordance with the detail on his chart. When their guns are ready to fire, they report to the senior section commander, who in turn reports to the fire controller **"Guns ready to fire."**

Fire Controller—**"Fire."**

The N.C.O. in charge of each gun will control the rate of fire and lifts, &c., as shown on his chart. He will also order **"stop"** at the end of each task.

Where time is allotted for points during firing on the fire control charts, the N.C.O. must see that this time is not exceeded.

SECTION 19.—SECTION DRILL—NIGHT FIRING.

Instructor's Notes.

Stores :—

Two guns, two tripods, two spare parts cases, two condenser cans, two condenser tubes, two dial sights, one aiming lamp, one aiming post, at least five ammunition boxes, belts, and dummy cartridges.

Both section commander and corporal will be in possession of a torch.

SAFETY PRECAUTIONS WILL BE CARRIED OUT BEFORE DRILL BEGINS.

The object of section drill — night firing — is to teach and exercise the section personnel in their drill duties as a fire unit by night.

LESSON 84.—PREPARE FOR ACTION AND COME INTO ACTION.

Instructor's Note.

Additional stores :—

Two subsection trucks.

Section Corporal—

" Belts—For night firing—prepare for action."

All duties are the same as for "For indirect fire—prepare for action," except that gun numbers will remain with their equipment in file in front of the trucks. No. 4 of the odd numbered subsection removes the aiming lamp.

The section corporal is responsible that all the necessary stores have been removed from the trucks. He will then detail loads and move the section forward to a position in rear of the gun pegs.

TO COME INTO ACTION.

Instructor's Notes.

Additional stores :—

Two gun pegs, two direction pegs, two zero posts.

These pegs and posts should be in position before this drill begins.

The section corporal reports to the section commander, and is shown the gun peg of No. 2 gun, the direction of the rear leg, and the direction of his direction peg and zero post.

Section Commander and Section Corporal—

" No. For night firing—Mount gun."

Nos. 1 and 2.—Mount their guns as in platoon drill—indirect, approximately over the gun peg.

Nos. 3.—When called for by the N.C.O. at the gun, will carry out their duties as in "Mount gun," elementary gun drill, with the exception that No. 3 of the odd subsection remains at the gun position and receives the aiming lamp from No. 4.

No. 4 of the odd subsection brings forward the aiming lamp and hands it to the No. 3 of the odd subsection after the No. 3 has placed the ammunition box and the condenser can at the gun position.

LESSON 85.—TO OBTAIN DIRECTION AND ELEVATION.

DIRECTION.

Section Commander informs the section corporal to which direction peg he is going first. Accompanied by the No. 3 of the odd subsection with aiming lamp and aiming post, he will place the lamp as low down as possible behind the direction peg, with the peg outlined down the centre of the lamp.

Section Commander—

" No. Direction."

No. 1, assisted by the No. 2, moves the gun until the line of sight through the collimator is aligned through the zero post on to the lamp. If the lamp is some considerable distance from the gun, the section corporal should shine the torch into the front of the collimator.

Section Corporal checks the aim, sees that the dial and deflection drums are at zero, orders the legs to be stamped in, checks, and orders No. 2 to set the direction dial on the tripod at **zero**. Reports **" No. Correct."**

Section Commander, having given direction to both guns, will direct the No. 3 to put in the aiming lamp. He will also collect the zero posts, and return to his gun.

No. 3 of the odd subsection will put in the aiming post, open the box, place on the aiming lamp, secure the box, attach the line, and bring the reel back to the section commander. He will then complete his ammunition duties.

Nos. 1 will align the collimator on to the aiming lamp.

NOTE.—When the direction pegs are in rear the procedure will be as above, with the exception that when "Direction" is ordered the dial sight will be set at zero on the front pointer. When the aim and dials have been checked by the section corporal the dial sight will be set at zero on the rear pointer and checked before the section corporal reports "No. Correct."

ELEVATION.

Section Commander.—As for Lesson 80, platoon drill—indirect.

Nos. 1 act as in Lesson 80, platoon drill—indirect, with the assistance of the N.C.O. at the gun. They will then adjust their collimators on the lamp.

LESSON 86.—TO CEASE FIRING AND ON TRUCKS.

Section Commander—

"Unload"—"Clear gun"—"In aiming lamp."

Nos. 1, 2, and 3.—Carry out their duties as in Lesson section drill—direct fire.

Section Commander—

"Cease firing."

Gun numbers will act as in Lesson 66, section drill—direct fire.

After the guns have been dismounted, the section commander will fall in the section, and check stores. He is himself responsible for the pegs and zero posts.

The section will move back to the trucks, led by the section corporal, the section commander moving in rear; on arrival the section commander orders **"On trucks."**

This drill will be carried out as in section drill, direct fire, except that No. 4 of the odd subsection will replace the aiming lamp in the trucks. The section commander will place the zero posts and pegs in his truck until such time as they can be transferred to the platoon commander's truck.

LESSON 87.—FIRE CONTROL CHARTS.

Instructor's Notes.

Additional stores :—

Two fire control charts, two watches, two zero posts, four pegs.

The section commander and section corporal will each have a fire control chart.

The drill will be as already taught up to the stage of the aiming lamp being put out.

Section Commander and Section Corporal—

"Load."

"Prepare for Task 1."

Section Corporal—Reports when his gun is ready.

Section Commander—

"Fire."

Each N.C.O. controls the fire of his gun as in platoon drill—indirect (charts).

When not actually firing on a task, guns will always be laid on the fixed line; guns will be half loaded, thumbpiece pressed, and sentries posted.

SECTION 20.—OBSERVATION OF FIRE AND RANGING.

GENERAL.

1. **Observation of fire** deals with deducing from the strike of the bullets the position of the beaten zone with reference to the target, and is a necessary preliminary to ranging.

Ranging is the process of determining by observation of fire the direction and elevation necessary to hit a given target.

2. Observation of fire and ranging are normally carried out by the fire controller. In heavy fighting, where unit control may break down, control by the firer will become necessary. Except in very favourable circumstances, little reliance can be placed on observation by the firer at ranges over 800 yards. The training in ranging, therefore, is confined to ranges of 1,000 yards and under, using the naked eye.

3. Personnel will require training as follows:—

Officers and N.C.O.s: To observe and correct the fire at all machine-gun ranges, using field-glasses when necessary.

All Ranks: To observe and correct fire, using the naked eye up to ranges of 1,000 yards.

Rangetaker: To observe fire, using the rangefinder, and to report the position of the strike.

4. Observation of Fire.

i. The possibility of observation of strike will depend on a variety of factors in addition to the distance of the observer from the target, of which the following are the most important:—

(a) The nature of the soil round the target. Sand, plough, and water generally give good results, but damp ground, long grass, and undergrowth are bad.

(b) Visibility as affected by light, mist, or mirage.

(c) The position of the sun. When low in the horizon strike is easier to pick up than when it is high.

(d) Wind. A high wind tends to blow away the dust caused by the strike before it can be observed.

The action of the enemy will often be a clue as to whether fire effect is being obtained—*e.g.*, cessation of hostile fire, &c.

In war, the fall of shell and the strike of bullets from other small arms near the target will interfere with accurate observation.

ii. It is a fundamental principle in observation of fire only to accept information which is definite or certain, and not to act on what is uncertain or no more than probable. Thus, before any deduction can be made as to the exact position of a beaten zone with reference to the target, it is necessary to decide whether the whole beaten zone is being observed or whether only a small portion of it is falling on ground which gives observation of strike, and if so, what portion of it.

Again, when a foreshortened view of the ground is obtained, it is possible to make errors of great magnitude if guesswork only is relied upon.

iii. In the engagement of targets with width or depth the beaten zones of the guns of the fire unit are distributed over the target according to the method of fire employed. Under these circumstances it is not always possible to determine that full fire effect has been obtained owing to the difficulty of checking each individual beaten zone.

iv. Tracer ammunition is only of value for determining correctness of line.

v. It must be remembered that it is necessary to observe the area in which the beaten zone is to fall, rather than the ground in the immediate vicinity of the definite aiming mark.

vi. It may occur that an area of ground adjacent to the target is specially suitable for observation. Under these circumstances it may be profitable to direct the fire on to this area in the first instance, correcting it on to the target as soon as observation has been obtained.

vii. Bursts of fire must be long enough to enable the beaten zone to be "found," as well as to produce the required fire effect on the target.

5. Ranging.

i. Ranging may be carried out—

(a) To correct fire on to a target as soon as the data obtained by observation warrant it.

(b) To register the direction and elevation required to hit a target after fire effect has been obtained.

- ii. It is required to bring the centres of the beaten zones on to their correct positions on the target as soon as possible after the first burst. This may entail corrections for elevation, or for direction, or for both.

LESSON 88.—OBSERVATION OF FIRE.

Instructor's Notes.

Stores :—

Sand model (or miniature range).

Strips cut to scale to represent beaten zones.

The instruction will take the form of a lecture on the subject matter of Sec. 20, illustrated on the sand model with the aid of models of beaten zones.

The instruction should be completed in the open country indicating types of ground and their effects on the beaten zones, showing approximate dimensions and giving practice to officers and N.C.O.s in the use of graticules and field-glasses.

The instruction to gun numbers will be confined to ranges up to 1,000 yards.

Opportunity should be taken on all occasions when ball ammunition is used to practise officers, N.C.O.s, rangetakers, and gun numbers in observing the strike of bullets.

LESSON 89.—OBSERVATION OF FIRE AND RANGING.

Instructor's Note.

Stores :—

Gun, tripod, slide rule or field-glasses, and prepared range card.

i. Explain :—

- i. The general principles to be followed are—

(a) **Only correct when it is certain that full fire effect is not being obtained.**

(b) When making corrections, unless the correction required can be determined accurately, **overestimate it rather than underestimate it**, always provided the safety of our own troops is not involved.

ii. Corrections for Line.

Observation of machine-gun fire is normally carried out from a position near the guns. From

such a position it is possible to measure the exact correction required, either with graticuled glasses, slide rule, or hand angles.

Nos. 1 may correct for direction on their own initiative, provided that good "strike" is being obtained, provided they are sure of the position of the beaten zone. They will not correct for elevation.

iii. Corrections for Elevation.

- (a) It is not possible to determine the exact amount by which the beaten zone is falling over or short of the target.

The length of the beaten zone being known, if the whole of it is seen it will give a useful guide as to the amount of correction to give (e.g., it might be estimated that the distance between the beaten zone and the target is either once or twice the beaten zone as seen on the ground).

- (b) It should be remembered that where a fore-shortened view of the ground is obtained, the tendency will be to underestimate the correction required.

As a rule, therefore, bold corrections should be given, particularly where there is no guide to the amount required.

The object is to include the target in a bracket rather than to creep towards it by inadequate corrections.

The actual manner in which corrections are given and acted upon will be found in Sec. 11, lesson 55.

- iv. When fire is being observed from a flank, the fact that the bullets appear to be falling behind or in front of the target, as viewed from the observation post, will give definite indications as to whether a right or left correction is required.

Again, bullets which are falling on the correct line gun-target will appear from the observation post to be right or left of it.

In these circumstances, to ascertain the actual position of the bullets with reference to the target, it is necessary to visualize the line gun-target on the ground and judge accordingly.

NOTE.—Gun numbers will be required to judge the range to targets up to 1,000 yards, officers and N.C.O.s up to 2,000 yards.

2. Method of Instruction.

i. Elevation.

- (a) Indicate a target to the firer and tell him to estimate the range.
- (b) Using his estimated range, give a fire order to bring fire to bear on this target.
- (c) Indicate the position on the ground where his bullets would fall, according to whether he has over or under estimated the range.

If this position is very difficult to indicate, lay the gun on it.

- (d) The firer now judges the correction required, adjusts his tangent sight accordingly, relays on the target, and continues firing.
- (e) If he has not made a suitable correction, indicate where the bullets are now falling.
- (f) Continue as above until it is considered that he has brought fire to bear on the target.
- (g) The firer now reports the correct range to hit the target.

ii. Direction.

- (a) Give a fire order to engage any suitable target.
- (b) Indicate the supposed position of the shots right or left of the target.
- (c) The firer deflects his line of sight, to the left or right of the target, by the amount the shots fell right or left of it originally.
- (d) Check the line of sight. Inform the firer that the shots are hitting the target, or, if the firer is in error, indicate a fresh point of strike and continue as above until the suitable correction has been made.
- (e) The firer now notes his point of aim.

iii. Direction and Elevation combined.

The firer will be required to obtain the correct elevation to hit the target, and to indicate a gun aiming mark which will give the necessary deflection right or left of it.

NOTE.—This lesson will be carried a stage further with officers and N.C.O.s; the instructor will indicate the supposed position of the shots from a section or platoon of guns, and the firer controller under instruction will give the necessary correction to bring the fire on to the target.

SECTION 21.—HEADQUARTERS TRAINING.

1. The object of headquarters training is to train the personnel of section and platoon headquarters in their duties in the field by day and night, under varying conditions and on different types of ground.

2. The training will be carried out with such personnel as are necessary for any particular exercise selected from the following:—

Platoon Headquarters—

- 1 platoon commander.
- 1 platoon sergeant.
- 1 orderly.
- 2 gun numbers.
- 1 batman.
- 2 truck drivers.

Each Section—

- 1 section commander.
- 1 section corporal.
- 1 orderly.
- 1 rangetaker.
- 2 truck drivers.

3. The platoon commander can combine the command of his platoon with directing an exercise.

Gun numbers and machine gun equipment are not required. Vehicles may or may not be taken out according to the exercise, at the discretion of the directing officer. The rangetaker will invariably take his instrument when exercises are carried out on the ground. Platoon and section personnel taking part will be required to function correctly, and to issue the necessary orders based on the tactical situations as pictured by the directing officer.

4. As a preliminary to headquarters training exercises, commanders will be practised in the following:—

- i. Reconnaissance of section areas.
- ii. Reconnaissance of indirect fire positions.
- iii. Procedure in occupation and evacuation of positions.
- iv. Issue of orders.

NOTE.—iii and iv can usefully be carried out in the form of tactical exercises without troops.

carried out from the area detailed. In order to reduce the time required for reconnaissance by the platoon commander, such areas should be as well defined as possible.

iii. Owing to the difficulty of locating targets exactly, a platoon commander may often receive a target in general terms—*e.g.*, a patch of gorse or the front edge of a wood. In this case he must, by every means in his power, attempt to locate the exact position of the enemy in the locality described, so that ammunition is not wasted by firing on unoccupied ground.

iv. In the occupation of a position it will be the duty of the platoon commander to determine, before the position is occupied, that the first target can be engaged, or task carried out, with safety to our own troops. When he is not controlling, he will, in his orders for the occupation of the position, inform the fire controller or controllers concerned that it is safe to fire on the first target, and will point out the position of our own troops.

The responsibility for subsequent safety will be with the fire controller.

The platoon commander should assist by keeping him informed as to the movements of our own troops.

3. i. **Fire direction** is the term used for the orders given by a commander of two or more fire units regarding the manner their fire is to be applied, and covers, therefore, the immediate orders given to a fire controller.

ii. When firing direct, the platoon commander directs the fire of his two sections, the fire being controlled by the section commander. The only means of communication at the disposal of a platoon commander for directing the fire of his platoon is by orderly or signal. As a guide, therefore, it is considered that where a whole platoon is required to fire over one arc, the two sections should not be farther apart than about 300 yards. To minimize the effect of shell fire and to assist concealment, they should not be closer than about 100 yards.

iii. The platoon commander, in deciding whether he will order one arc for both sections or an arc for each, should remember that for ranges over 2,000 yards the fire of four guns is normally necessary in order to get full fire effect. Therefore, when targets over that range have to be engaged, they must be included in the arc of each section.

4. Direct Fire.

i. The platoon commander reconnoitres his platoon area with a view to selecting section areas, positions in readiness

platoon headquarters and O.P., and decides on the disposal of his vehicles to positions under cover.

In deciding on section areas, the platoon commander will look for positions which offer the following advantages:—

Suitability for the task.

Ability to observe the movement of own troops.

Covered approaches.

Concealment for guns. (See Lesson 90, para. 12 (ii).)

Ease of control.

Covered positions for vehicles.

ii. The section commander reconnoitres his area for a position for each gun and for a control post. In selecting these the section commander will consider the points detailed in the platoon commanders' reconnaissance above. To prevent the occupation of unnecessarily exposed positions, he should be clear as to the exact nature of his task and the near limit of arc.

There are three methods of bringing the guns into action open to the section commander:—

(a) To use the section orderly, when available, to mark one gun position, while he himself marks the other one, the guns being ordered or signalled into action independently; or

(b) To signal the guns up in turn, pointing out to each No. 1 as he arrives the gun position, first target, arc of fire, and reference points; or

(c) To go back and bring forward Nos. 1 with tripods as far as cover allows, and point out gun positions, &c., as in subpara (b), above.

iii. When firing over an arc, section commanders must exercise great care in the selection of targets and the moment to open fire. Targets which will have the greatest effect on the operations must be engaged first, and fire unit commanders should not allow themselves to be led into firing on targets which may be more obvious but not so dangerous tactically.

Premature opening of fire against unimportant targets may have the effect of disclosing the positions of the guns unnecessarily, and drawing enemy fire.

iv. In deciding on the rate of fire to be used the following factors must be taken into consideration:—

The tactical situation, the target, the range, the state of the ammunition supply, and the effect it is desired to produce in a given time.

5. Indirect Fire.

i. The main occasions on which indirect fire is or might be employed may be summarized as under :—

- (a) When it is impossible, or inadvisable, to occupy a direct fire position.
- (b) In darkness, mist, or smoke.
- (c) When guns placed in depth, in direct fire positions to prevent penetration in defence, can by this means alone fire in front of the foremost troops.
- (d) When it is desired to place some guns in positions from which they can be easily withdrawn, and in which direct positions would not give such facility.

ii. When firing indirect, the platoon commander controls the fire of the platoon, unless the tactical situation demands his whole attention, or unless he is concerned with liaison duties. In these cases he will delegate the fire control to the platoon sergeant.

The platoon commander reconnoitres for—

- (a) A position for the guns.
- (b) Fire control observation post.
- (c) Position in readiness.
- (d) Covered positions for vehicles.

iii. In selecting the gun position the commander is influenced by :—

- (a) Crest clearance.
- (b) Enemy observation. This may be from the flanks.

6. Platoon Headquarters.—The requirements are—

- i. Ease of communication between sections, the O.P. and platoon headquarters.
- ii. Good covered approach.
- iii. Concealment.

NOTE.—Arrangements must be made for headquarters to be found easily by our own troops.

7. Observation Post (O.P.).—The requirements are—

- i. View of enemy positions or lines of approach, and ground over which our own troops may move.
- ii. Good covered approach.
- iii. Accommodation for the required number of men.
- iv. Concealment.

8. Control Post (C.P.).—The following requirements are necessary :—

- i. Full view of the whole arc for which the section is responsible.
- ii. As inconspicuous as possible.
- iii. Good covered approach.
- iv. Accommodation for the required number of men.
- v. Concealment for fire control signals to be made.
- vi. Within voice control of the guns. Wherever possible the control post should be on the left of the guns.

9. Distribution of Personnel and Loads to Vehicles.

The details of loads and distribution of personnel to vehicles are shown in Sec. 15, and are based on—

- i. Availability of equipment and stores.
- ii. Restrictions imposed by weight and seating accommodation.
- iii. The necessity for means of forward reconnaissance without undue disturbance of personnel.
- iv. The fact that when a commander is required to carry out a task, whether as a section or as part of the platoon, his rangetaker must be available in the earliest stages of his reconnaissance.

The procedure for reconnaissance and occupation which follows is outlined to meet ordinary conditions. Under certain circumstances modification may be necessary and it is left to the commander to decide, in accordance with the situation, whether he can dispense with any detail or alter procedure.

The employment of the platoon (motor-cyclist) orderly is not always specified because of the platoon's dependence on varying communication requirements.

METHOD OF INSTRUCTION.

Instructor's Notes.

The method of instruction will be as follows :—

1. Lecture on the subject matter of paras. 1 to 9 above.
2. Teach and explain the duties in each lesson with the aid of a prepared sand table.
3. Headquarters training exercises on the ground or sand table with the personnel required for any particular phase.
4. The duties of all commanders will be further practised in section and platoon training exercises, where all

personnel and equipment are present. Technical as well as tactical problems should be included in these exercises.

Such exercises afford excellent opportunities for practising fire orders upon a natural landscape.

LESSON 90.—OCCUPATION OF A POSITION—DAY.

The Platoon Commander.

1. When called for by the company commander, either for reconnaissance or for the receipt of orders, he will always take his reconnaissance party with him in his truck.

This will consist of—

- Two section commanders.
- Two section orderlies.
- Two rangetakers.
- Platoon orderly on a motor-cycle.

2. When receiving orders the platoon commander will take his orderly with him. Whenever possible he should have at least one section commander with him who can also hear the company commander's orders.

The rest of the reconnaissance party will remain under cover as close as possible.

3. As soon as he knows his platoon area he will, if necessary, send a message to the platoon sergeant including—

Brief information.

Platoon role.

Order to move the platoon to a R.V. near the area indicated by the company commander. This should include a warning about any particularly exposed places on the route.

His own action.

4. He will then decide upon his reconnaissance plan and will mentally note likely positions from which the tasks could be done.

5. The rest of the reconnaissance party will be put in the picture.

6. He will, if necessary, move to the area indicated.

7. On arrival in his area he will decide whether to use direct or indirect fire. Direct fire will be used whenever possible.

8. i. If he decides upon direct fire he will decide on :—

- Section areas.
- Positions in readiness for each section.
- Arcs of fire and targets, if any.

Positions for trucks under cover.

Arrangements for local protection.

Positions of O.P. and platoon H.Q.

ii. He will find out the position of his own troops and will solve any immediate overhead safety problems.

iii. On completion of his reconnaissance, the platoon commander will issue orders to the section commanders, including as many of the following points as may be necessary, according to the situation :—

Information.

Intention.

First target, and arcs of fire.

Near limit of arc, if any.

Section areas.

Positions in readiness.

Arrangements for local protection.

Factors affecting safety.

Ammunition allotted.

Administration, including—

Ammunition supply.

Medical arrangements.

Position of section trucks under cover.

Position of platoon H.Q., O.P., and company H.Q.

Any light signals.

Zero hour.

iv. He will send section commanders, accompanied by their rangetakers and orderlies, to section areas to carry out their reconnaissance on foot.

9. i. The platoon commander will return to the platoon R.V. in his truck and will give orders to the platoon sergeant and section corporals as under :—

Brief information.

Intention.

Positions in readiness and routes to them.

Section areas.

Ammunition required.

Places to which trucks are to go.

Time available.

He will send the section corporals to lead their sections to their positions in readiness; he will give additional orders to the platoon sergeant concerning—

Position of platoon H.Q.

Local protection, and the siting of the anti-tank rifle.

When the platoon sergeant has carried out these duties he will report to the platoon commander for full information so that he will be in a position to take over command, if necessary.

ii. Alternatively, where ground permits, the platoon commander having completed this reconnaissance may point out to the orderlies the position in readiness for each section, and will tell them how many belts are required.

He will then send them to the platoon R.V. in his truck, with orders to guide the sections to their respective positions in readiness, and to inform the platoon sergeant of the position of platoon H.Q.

He will then issue orders to the section commanders as in 8, iii, above, and will send them on their reconnaissance.

On arrival of the platoon sergeant, he will give him orders including :—

Information.

Positions of O.P., platoon H.Q., and cover for vehicles.

Local protection and the siting of the anti-tank rifle.

10. When both sections have been reported in action, the platoon commander will send the platoon orderly to company H.Q. to report the platoon in action.

The Platoon Sergeant.

11. i. Will organize platoon H.Q.

ii. Will carry out any orders about local protection.

iii. When the section orderlies report to the platoon H.Q. that their sections are in action, he will send one to the platoon commander to report the platoon in action, if this has not already been done.

iv. Will give orders for concealment of platoon H.Q. vehicles.

v. As soon as the situation permits, he will come up to the platoon commander and get full information about the task of the platoon, and the position of all the neighbouring troops, so that he can take over command instantly if required.

The Section Commander.

12. The section commander, on receipt of orders, will proceed to his section area accompanied by his rangetaker, and orderly, if available.

i. On arrival he will give orders to the rangetaker regarding :—

Arc of fire.

Points to which he requires ranges (*i.e.*, targets, key ranges, and such points as will help him in the solution of any safety problem).

Time available.

Probable position of control post.

ii. He will reconnoitre for—

Control post.

Two gun positions.

(Whenever possible these should provide cover from fire, view, and air.)

iii. He will decide on reference points, and on the method by which he is going to bring the guns into action.

iv. He will bring the section into action by one of the methods given in Sec. 22, 4, ii.

v. When the section is in action, he will report this fact to platoon H.Q.; normally by sending the section orderly to platoon H.Q. Section orderlies will be sent via the platoon O.P. If the platoon commander is there he will send one orderly back to platoon H.Q. to report to the platoon sergeant and will retain the other with him.

vi. At the first opportunity he will explain the situation to the section corporal.

vii. When the opportunity arises he and the section corporal will pass on all available information to the rest of the section.

The Section Corporal.

13. i. On receipt of the platoon commander's orders will lead his section to its position in readiness.

ii. On arrival at the position in readiness, he will order " . . . belts—prepare for action," will supervise the prepare for action, detail loads, and lead the section forward to the section area.

iii. He will dispose of the vehicles under cover as ordered.

iv. He will order guns into action when signalled for by the section commander.

v. In addition, he will report to the section commander for details of the task, arc of fire, targets, &c., and will organize the chain of supply from the vehicles to the section area.

The order in which these tasks are performed will depend upon the situation at the time.

14. Duties during Action.

i. Platoon Commander—

- (a) Keeps in touch with the situation, carrying out reconnaissance where necessary.
- (b) Issues fire direction orders as required.
- (c) Reports the tactical situation, ammunition, and casualty states to the company commander.

ii. Section Commander—

- (a) Controls the fire of his section, and interprets the fire direction orders of the platoon commander into fire control orders.
- (b) Locates and deals with targets.
- (c) Solves safety problems as they arise, and indicates safety limits.
- (d) Makes arrangements to continue firing in case observation is at any time interrupted.

iii. Section Corporal—

Will supervise the chain of supply, and will so dispose the higher numbers as to prevent the section from being surprised from the flank or rear.

iv. He will periodically obtain the latest information from the section commander.

LESSON 91.—MODIFICATIONS FOR INDIRECT FIRE.

1. Duties on Decision to occupy the Position.

The Platoon Commander.

i. Having decided to employ indirect fire, the following modifications will be made in the procedure for the occupation of a position given in Lesson 90.

ii. He will make a rough decision as to the gun position and the position in readiness, and then send his orderly to lead the platoon forward from the platoon R.V. to a point as close as possible to the gun position, which will normally be the position in readiness already chosen.

iii. The platoon commander will give orders to the range-takers as under:—

First target.

Any other points to which ranges are required.

Time available and place to which to report ranges.

iv. He will take with him a section orderly, a director, and zero posts and will decide on—

Gun positions.

Gun frontage.

Position in readiness.

Method to be employed.

Position of O.P. and platoon H.Q.

Position under cover for vehicles, and a point to which they will return when ordered.

v. He will issue to the section commanders, or to all N.C.O.s if the platoon has already arrived at the position in readiness, orders which will include—

Information.

Intention.

Method of indirect fire to be employed.

Gun position and pivot gun if necessary.

Gun frontage.

Position in readiness.

Ammunition required.

Position under cover for trucks, and point to which they will return when ordered.

Arrangements for local protection.

Position of O.P., platoon H.Q., and company H.Q.

When fire is to be opened.

vi. The platoon commander will now complete his calculations to engage the target. At the first available opportunity he will give the platoon sergeant full information.

vii. The junior section commander will, unless orders have been issued to all N.C.O.s, be responsible for meeting the platoon at the position in readiness and informing the platoon sergeant of the position of platoon H.Q. and the O.P., and of arrangements for local protection.

He will then take charge of the prepare for action as laid down in platoon drill—indirect fire (Lesson 73), and will inform the senior section corporal of the position under cover for the trucks.

2. Duties during the Occupation.

i. The Platoon Sergeant—

Establishes platoon H.Q.

Arranges local protection as ordered.

Reports to the platoon commander for full information.

ii. The Senior Section Commander—

Having received the platoon commander's orders, calculates minimum quadrant angle, supervises the guns coming into action, and carries out the duties laid down for him in platoon drill—indirect fire.

iii. *The Junior Section Commander—*

When necessary, moves the platoon to the position in readiness. He orders “. . . belts—for indirect fire—prepare for action.” If necessary, he details loads to higher numbers.

Moves the platoon forward in rear of the gun position. Carries out the duties laid down for him in platoon drill—indirect fire.

iv. *The Senior Section Corporal—*

Assisted by the junior section corporal, sends the vehicles to the position under cover and tells the drivers where to return on being ordered.

Organizes the chain of supply.

3. **Duties in Action.**

i. *The Platoon Commander—*

As in a direct fire position, except that normally he controls the fire of the platoon.

ii. *The Platoon Sergeant—*

Acts as second-in-command of the platoon and is prepared to take over the duties of the fire controller.

iii. *The Senior Section Commander—*

Commands at the gun position and reports ammunition state to the platoon commander.

iv. *The Junior Section Commander—*

Carries out such duties as laid down for him in platoon drill—indirect fire.

v. *The Senior Section Corporal—*

Assisted by the junior section corporal, supervises and controls the supply from the vehicles to the gun position.

LESSON 92.—OCCUPATION OF A POSITION—
NIGHT.

**Duties where Preliminary Reconnaissance can be
carried out in Daylight.**

I. **Before Occupation.**

The Platoon Commander.

- i. (a) The platoon commander proceeds to his platoon area, taking with him a reconnaissance party consisting of—

Two section commanders with director and pegs.
Two rangetakers.
Two orderlies.

If not otherwise required, the platoon sergeant should accompany this reconnaissance.

- (b) On arrival he carries out his reconnaissance, including the selection of gun positions.

He orders the necessary ranges to be taken.

He, and the platoon sergeant, if present, proceed to carry out the pegging of the positions (as in Sec. 26), assisted by the section commanders.

ii. He now decides on—

- (a) The points shown in Lesson 90, 8, i.
(b) The type of concealment and extent of digging, if any, to be carried out.
(c) Positions in readiness for the sections and a rendezvous for the platoon.
(d) The approaches from the rendezvous to the positions in readiness and to the gun positions, arranging that these routes can be recognized in the dark.

iii. He gives the platoon sergeant and section commanders all available information regarding enemy, own troops, and targets, and issues orders on the points included in subpara. ii, above.

He leaves the rangetakers or orderlies in the platoon area to safeguard the preparations made for occupation.

iv. When the reconnaissance is completed the party, less those required to safeguard the preparations, will return to the platoon, where the platoon commander will—

- (a) Prepare fire control charts and issue and explain them to the N.C.O.s concerned.
(b) Issue all available information to the platoon.
(v) On occasions the reconnaissance party may have to be reduced to a minimum :—

Platoon commander, or platoon sergeant.

1 rangetaker.

1 man with director and pegs.

In this event the platoon commander will be responsible for the pegging of both section areas.

He will issue orders as in iii, above, on return to the platoon.

2. **Duties on Occupation of the Position.**

i. On arrival at the rendezvous, if the section commanders were present during the reconnaissance, they lead their

sections direct to the positions in readiness, and come into action.

ii. If the section commanders were not present during the reconnaissance, the platoon commander, or the platoon sergeant if he reconnoitred the position, takes forward one section to its position in readiness, orders the section corporal to prepare for action, leads the section commander to the gun positions, and points out the gun and direction pegs to the section commander. He then returns to the rendezvous and leads the other section to its position in readiness, and points out gun and direction pegs as for the other section.

iii. When necessary, he orders the platoon sergeant to collect the section vehicles and take them to the prearranged place.

3. Duties when no Daylight Reconnaissance is possible.

i. It is possible to arrange for fixed lines with fair accuracy at close ranges, provided that a light can be shown on the place where the fire is to fall.

The platoon commander first chooses positions for his sections by personal reconnaissance.

ii. Having given orders for the occupation of the positions he proceeds with a torch to the place or places where he requires the fire of the sections, and exposes a light in the direction of the guns. (For technical procedure, see Lesson 132.)

iii. A signal must be arranged to notify the platoon commander when guns have been correctly laid.

LESSON 93.—DUTIES SPECIAL TO DEFENCE.

I. Duties on Decision to occupy a Position.

In addition to the points already given in Lesson 90, para. 8, iii, the platoon commander will include in his orders:—

(a) The position of our own troops in the vicinity of section areas and arcs of fire.

(b) Approximate areas in which fixed lines are to fall.

(c) S.O.S. signal and the action to be taken when S.O.S. signal goes up.

Normally, S.O.S. signals will only go up at night or when visibility is bad. Defensive fire on fixed lines will be required as soon as the S.O.S. goes up.

(d) Rate of fire and ammunition to be used on fixed lines.

(e) Any reservation of ammunition necessary for primary tasks.

- (f) Any special orders for local protection and concealment.
- (g) Orders regarding digging.
- (h) Intercommunication.

2. Duties during the Occupation.

i. The Platoon Commander—

(a) Having given his orders, he will ascertain from rifle units near his gun positions and in the area where his defensive fire is required to fall, the exact dispositions of their troops, so as to ensure necessary safety. He will also ascertain the positions from which the signal for defensive fire will be sent up, and will discuss the co-ordination of digging and wiring.

(b) He returns to the section positions, and gives orders in detail as to fixed lines, the positions from which the signal for defensive fire will be sent up, and any other points in para. 1, above, not already sufficiently dealt with.

(c) He then visits nearby unit commanders and arranges to keep in touch with them.

(d) As soon as he receives messages from his sections that they are in action, he reports his platoon in action to his company commander.

ii. The Platoon Sergeant—

Having established platoon H.Q. and arranged for local protection (including the siting of the anti-tank rifle), proceeds with platoon H.Q. vehicles to the position or positions ordered, takes over the section vehicles from the section corporals, and moves the whole as ordered.

He will then return to platoon H.Q. and obtain full information from the platoon commander.

iii. The Section Commander of each Section—

On arrival in his section area, in addition to his duties given in Lesson 90, para. 12—

(a) Posts sentries.

(b) Orders the rangetaker to construct a range card for the arc, naming the points to which he requires ranges.

(c) Orders the guns to be mounted in temporary positions to cover the arc, and to be laid on temporary fixed

lines until the exact position of permanent fixed line is decided upon.

NOTE.—In order to obtain concealment for such temporary positions it may be necessary to sacrifice a little of the allotted arc.

- (d) Immediately he receives details of the fixed line, has the guns laid on this line (Lessons 130, 131).

NOTE.—Where guns have a forward task in addition they will be laid initially on the forward fixed line, and arrangements will be made for the switch from forward to penetration fixed line.

- (e) Arranges for the concealment of the position and stores.
 (f) Organizes digging.
 (g) Orders the section corporal to take the vehicles to the position ordered.
 (h) Sends the section orderly to platoon H.Q. to report section in action.
 (i) Informs all ranks of the signal for defensive fire, the action to be taken in case of alarm, the positions of temporary alarm posts, and the details of ranges.
 (j) Selects permanent alarm posts, makes out the duty roster.
 (k) Marks in on his range card the area within his arc in which it is safe to fire.
 (l) He will take the earliest opportunity of visiting infantry posts near his area.

NOTE.—Throughout the occupation of the position, and whilst in action, the section commander will—

Ensure that any information regarding enemy, own troops, &c., received is immediately passed on to all ranks of his section.

iv. *The Section Corporal of each Section—*

- (a) Ensures that all stores are removed from the vehicle, taken forward, and placed under cover near the gun position.
 (b) When ordered by the section commander, moves the section vehicles to the position ordered, and hands them over to the platoon sergeant.
 (c) Reconnoitres for a supply of water.
 (d) Reports to the section commander for full information and informs him of the result of his reconnaissance for water.

3. Inspection of a Section Area in Defence.

The following are some of the points which a platoon commander will check when he inspects the area occupied by one of his sections in a defensive position. There are many points which are not mentioned and which will vary with the situation.

i. Is the section commander in the picture?

- (a) Does he know latest information about enemy?
 (b) Own troops—
 (i) Does he know their position?
 (ii) Has he made contact with those nearest?
 (iii) Has he full information about patrols?
 (iv) Has he arranged for protection by neighbouring troops—e.g., dead ground?
 (v) Does he know position of nearest H.Q.?

ii. The task:—

- (a) Arc—
 (i) Can both guns cover the whole arc?
 (ii) Organization of arc, including reference points.
 (iii) Range Cards: Areas in which unsafe to fire marked in on range card; there may be short range card for use of section corporal.
 (b) Fixed line—
 (i) Location and Safety: Remember platoon commander details an area in which fire is to fall. Section commander responsible for selecting actual point of aim and for ensuring that fire is safe and effective.
 (ii) Aiming post planted and collimators adjusted.
 (iii) Deflection dials and direction dial at zero.
 (iv) Range and angle of sight left on respective drums and recorded.
 (v) Aiming lamps ready for use.

iii. Stores:—

- (a) Everything off the trucks.
 (b) All ammunition handy to the guns.
 (c) Spare parts cases—must be complete.
 (d) Oil in traversing handles.
 (e) Stores not required at guns concealed in convenient and tidy dump.
 (f) Water: Condensers full and source of supply reconnoitred.

- (g) Cases, cans, oil.
- (h) Spare parts box: all breakages replaced.
- iv. Readiness:—
 - (a) Sentry (or sentries) posted; gas detectors.
 - (b) Duty rosters for sentry and digging made out.
 - (c) Digging properly organized and in progress or completed.
 - (d) Guns camouflaged as necessary.
 - (e) Guns half loaded and thumbpiece pressed.
 - (f) S.O.S. and place from which it will be sent up.
 - (g) Alarm post—use of higher numbers to give local protection and all-round defence.
 - (h) Alarm signal; gas signal.
- v. Section personnel:—
 - (a) Has all information been passed on to every man—especially regarding S.O.S.?
 - (b) Does everyone know his action on the alarm signal?
 - (c) Are all administrative instructions fully understood—including sanitary arrangements?
 - (d) Do neighbouring troops know whereabouts of line of fire, and have arrangements been made to prevent their crossing it?
 - (e) Does everyone know position of platoon H.Q. and route to it?

LESSON 94.—DUTIES SPECIAL TO WITHDRAWAL.

I. Occupation of a Position.

i. Normally, withdrawal will be part of a delaying action, in which case guns will be used on wide frontal arcs and will have the task of making the enemy deploy at long ranges. This will influence the choice of section areas.

ii. Positions must also be such that trucks can come up close to section positions when the guns are ordered out of action. Covered routes for the withdrawal will be necessary.

It will be the duty of the platoon commander to lay down the places to which trucks may come.

iii. The normal duties for occupation of a position in defence will be carried out, subject to such modifications as are necessary to ensure these conditions, and to the time available for occupying the position.

2. Preparation for Withdrawal to a New Position.

Normally, a warning order is issued and this will usually run as follows:—

“ ——— will withdraw. No rearward movement except recce. parties before ——— hrs.
 Recce. parties will report to ——— at ——— at ——— hrs.
 Thinning out may begin at ——— hrs.
 The position will be abandoned at ——— hrs.
 All personnel will be clear of ——— by ——— hrs.”

The Platoon Commander will—

i. Send this message to his section commanders and will order the maximum recce. parties he can spare to report to the new position.

ii. Choose a platoon R.V. in rear of the position and a route to it for each section.

iii. Reconnoitre the route to the company R.V., if any.

iv. Decide the method of withdrawal.

v. Arrange to bring up his vehicles, if necessary.

vi. Issue orders to his section commanders about the above, giving—

Method of withdrawal and description of new position.

Timings.

Routes.

Platoon R.V., or section R.V.s on the new position.

Company R.V., if any, and route to it.

Route platoon H.Q. will take.

Arrangements for bringing up trucks, if necessary.

The method by which the order to withdraw will reach the section commander.

The Section Commander—

He will make a plan for the removal of his stores and kit when thinning out begins, and will see that all are informed.

He will be responsible that the route to the platoon R.V. is reconnoitred.

3. Reconnaissance Parties.

The minimum reconnaissance party is the—

Platoon sergeant,

1 rangetaker,

2 gun numbers (one per section),

platoon orderly.

This party will travel in a platoon H.Q. truck, taking pegs and a director if these are likely to be required.

Sufficient tools should be taken to enable the reconnaissance party to make hasty emplacements or to improve the existing cover.

4. The Reconnaissance of the New Position.

The platoon sergeant will do the platoon commander's reconnaissance as in Lesson 90, 8, i, and will order the range-taker to prepare range cards for both sections.

If present, the section corporals will do the section commander's reconnaissance. If not, the platoon sergeant will carry out a complete reconnaissance of each section area and will point out the gun positions, arcs of fire, and positions in readiness to the two gun numbers who will act as guides. These guides will be posted on the route along which the platoon will withdraw and, on the arrival of the platoon, each will lead his section to the position in readiness and then show the section commander the gun positions and tasks.

As soon as the reconnaissance is complete the platoon sergeant will send a message to the platoon commander giving him full information of the new position and of the arrangements he has made for the meeting of the platoon when it arrives.

The platoon sergeant will remain on the new position and, on the arrival of the platoon, will superintend its occupation. He will hand over to the platoon commander as soon as the occupation is complete.

5. The Withdrawal.

Platoon Commander—

- i. Will personally give the order or send a written message to withdraw.
- ii. Will satisfy himself that the withdrawal has been carried out.
- iii. Will take charge of the platoon at the platoon R.V. and move it to the new position, unless it has been necessary to order section R.V.s on the new position.

Section Commander—

- i. The actual method of withdrawal will depend upon the proximity of the enemy, the time available, the ground, and whether the withdrawal is to take place by day or night.

ii. The platoon commander may decide to adopt one of the following methods or any variations of them :—

- (a) A suitable method by day—particularly when there is cover available close behind the section area—is as follows :—

- (i) Trucks will be brought up under cover as close as possible to the gun position.
- (ii) Higher numbers and unwanted stores will be moved back to this point as soon as the time for thinning out arrives.

NOTE.—As a guide, section commanders, Nos. 1 and 2, and one other should be left at the guns.

- (iii) When the time for abandoning the position arrives, the guns and remaining stores will be moved back under cover, loaded up, and the trucks will proceed to the platoon R.V.

- (b) An alternative method :—

- (i) When the time for thinning out arrives one subsection truck will be signalled up to a suitable position under cover. The higher numbers will move back the unwanted stores to this point and load them on to the truck. The truck will then proceed to a section R.V., taking as many higher numbers as are not needed for the final withdrawal of the guns. (See note in method (a) above.)
- (ii) The other subsection truck will remain under cover until signalled for at the last moment, and will then come as close as possible to the gun position.
- (iii) Both guns and the remaining numbers will go back in this truck, which will move as rapidly as possible to the section or platoon R.V.

NOTE.—It may be found best in open country for the last truck to move as fast as possible right up to the gun position.

- (c) If the withdrawal is by night the following modifications must be made :—

- (i) Trucks will not be brought up so close to the position as to jeopardize safety through noise.
- (ii) Sufficient time must be allowed for the thinning out to take place quietly, by organized parties commanded by a N.C.O. or a senior private.

- (iii) The section commander will ensure that sufficient personnel, ammunition, and stores are left with the guns to maintain them in action until the order to withdraw is given.
- (iv) When the order arrives he will move back with the guns to the platoon R.V.

On arrival at the new position he will find out all details from the gun number of his section (see para. 3 above) and from the platoon sergeant, and will put the section into action himself.

iii. **The Platoon Sergeant**—accompanied by the minimum reconnaissance party—

- (a) In accordance with the orders he has received, and after reconnaissance of the ground; will select section areas, gun positions, and positions in readiness and a platoon control post.
- (b) Will point out the arcs of fire of the sections and reference points within these arcs to the range-taker, who will take the necessary ranges and prepare range cards for both sections.
- (c) Will point out the section gun positions, arcs of fire, and positions in readiness to the two gun numbers, who will act as section guides. The guides will then be posted on the line of withdrawal of the platoon, or if the sections are withdrawing independently, at section rendezvous, from which they will lead the sections to their respective areas.

On arrival in these areas the guides will there give the section commanders all known information about the section positions.

- (d) Will send a message to the platoon commander informing him where the section guides will be posted and giving any essential information regarding the new position. He will remain on the new position, meeting the platoon commander on the latter's arrival there, and reporting fully about it and the situation as known. The platoon commander will in turn communicate that information to the section commanders.

6. Withdrawal to the New Position.

i. The Platoon Commander—

- (a) Will give personally or send the order to withdraw, including any of the points in para. 2, i, above, which he has not previously given.

- (b) Will control the movement of the sections from the platoon rendezvous or, if the sections move independently to the new position, keep touch with their progress.

ii. The Section Commander—

- (a) On receipt of the order to withdraw, will order "**Cease firing**"—and, having signalled to the trucks to come up to their forward positions, "**on truck.**"
- (b) When all stores and personnel are on the trucks, will lead them back by the selected route to the platoon rendezvous or to the section rendezvous.

iii. The Section Corporal—

Will be responsible for sending the trucks forward when signalled up by the section commander. He will then assist the latter in controlling the "On truck" action.

APPENDIX I.

SPOTLIGHT APPARATUS FOR TRAINING M.G. PERSONNEL.

After the apparatus has been correctly assembled to the gun, and all connections made (see sketch in box), the following is the procedure:—

Focusing.—Telescopic focus from the rear end of the spotlight projector.

Harmonizing.—The light must be harmonized with the tangent sight, and this is done as follows:—

Set the spotlight sight (converted Lewis gun sight) and the tangent sight to the same range—*e.g.*, 1,500 yards. Lay the gun on a good aiming mark and bring the light on to it by making vertical adjustments by means of the thumbscrew on the projector, and lateral adjustments by means of the clamping screw *underneath* the projector sight. Extreme accuracy is required in making these adjustments.

The apparatus is now ready for use.

The apparatus can be used for teaching N.C.O.s and men, exercising them in indication and recognition, for demonstrating fire orders, and for exercising men in interpreting fire orders, using combined sights and making corrections for wind.

In demonstrating fire orders it is necessary that the light should be controlled from the thumbpiece switch in conjunction with the vibrator, which is done quite easily by connecting the wiring up in a different way.

On the fire order being given the gun numbers carry out their duties in the normal way. In order to maintain the harmonization of the light with the tangent sight, it is necessary for the instructor or an assistant to adjust the projector sight to correspond with the tangent sight.

Example.—The order is given “**All 1400.**”

No. 1 sets the tangent sight to 1,400 yards.

The instructor or assistant sets the projector sights to 1,400 yards.

In the case of combined sights:—

The order is given “**.... All 1600.**”

Nos. 1 set their tangent sights as ordered.

The instructor or assistant sets the projector sights to 1,600 yards—*i.e.*, the correct range.

The order is given “**STOP.**”

“**No. 1 down 50.**”

“**No. 2 up 50.**”

Nos. 1 set their tangent sights accordingly.

The instructor leaves his projector sights at 1,600.

This will have the effect on the target of one gun being slightly high, and the other being slightly low, and on opening fire the rings of light will have the appearance of overlapping beaten zones. It is here that the necessity for extreme accuracy in harmonizing is seen.

In teaching or exercising men in fire orders it is necessary that the light should be controlled independently of the thumbpiece switch. Hence the press switch which is controlled by the instructor. This control is necessary for the following reason:—

Instead of the No. 1 carrying out his duties as taught, occasionally checking his aim between bursts, traversing correctly 15 minutes, relaying on the command “Stop,” &c., he would allow himself to be guided by the light. Whereas if the instructor controls the light, he can produce as necessary for the purpose of checking the actions of the No. 1.

Making Correction for Wind.

On the upper side of the clamping plate of the projector sight will be seen a series of graduations. These are for making or checking corrections for wind. The graduations are of 15 minutes, and are adjusted by means of the small milled head screw at the side. Normally, this scale must be kept at zero.

On a wind correction being ordered, the No. 1 makes his adjustment by tapping his gun. The instructor or his assistant adjusts the projector sight the amount ordered. On opening fire the light should now still fall on the target, showing whether the man's adjustment is correct or otherwise. On completion of the fire order care must be taken to re-zero the wind scale.

The vibrator should be used to teach the correct length of burst according to the range, and later as a check on the man in doing so.

In using the apparatus the following suggestions are made :—

1. Service guns should be used to eliminate as far as possible any play between the gun and tripod.

2. As the apparatus will normally be used indoors, a "T" base or sand-bags should be used to allow the traversing clamp to be adjusted correctly by the No. 1.

3. Guns must be placed as close together as possible, otherwise, as the guns are switched about over the landscape target, the light will tend to go out of focus, and errors will creep into the harmonization.

APPENDIX II.

INFANTRY PACK.

1. The pack is used as the normal method of carrying guns and equipment by machine-gun platoons in countries where the nature of the ground is unsuitable for vehicles.

2. It is desirable that animals for machine gun-pack saddlery purposes should be carefully selected. Those with abnormally broad hips, or with points of the hips very prominent, should not be chosen.

3. Description and assembling of Packsaddlery.

Instructor's Notes.

Stores :—

As shown in the table below.

DETAIL OF INFANTRY SETS.

(For infantry whose equipment is carried on pack.)

Description.	Number for each.	
	Gun and Tripod Set.	Ammunition Set.
(1) Section D.I.	(2)	(3)
Bands, belly, P.M.G.	1	..
Bands, belly, P.M.G., straps, long	1	..
Bands, belly, P.M.G., straps, short	1	..
Bands, belly, P.M.G., straps, supporting	2	..
Bits, bridoon, P.G.S.	1	1
Breechings, P.G.S., Mark V	1	1
Caps, shovel, Mark II*	1	..
Cases, horse-shoe, P.G.S.	1	1
Chains, collar	1	1
Collars, breast, P.G.S., Mark V	1	1
Collars, head, P.G.S., Mark IV	1	1
Cruppers, P.G.S., Mark V	1	1
Girths, P.G.S., Mark V	2	2
Girths, leather	1
Hangers, gun, sling	1	..
Hangers, tripod, sling	1	..
Pannels, P.G.S., Mark V, pairs	1	1
Racks, boxes, belt, ammunition, infantry	1	2
Reins, bridoon, P.G.S.	1	1
Straps, girth, P.G.S., Mark II	4	4
Straps, pick and helve	3	..
Straps, detachable, shovel	1	..
Trees, P.G.S.	1	1

The sets of packsaddlery comprise certain articles of general service packsaddlery, supplemented by other articles of machine gun packsaddlery.

Each article of packsaddlery will be described.

Explain and demonstrate how the parts are assembled.

4. Description.

Articles Common to both Cavalry and Infantry Sets.

Case, Horse-shoe.—For cavalry sets, the pattern formerly used for harness purposes, modified by the removal of the link from the back and the release of the strap with the chape (the latter being reduced in width to the size of the strap) are used.

For infantry the pattern formerly used for harness purposes (unmodified) is utilized.

Bit, Bridoon.—Is an ordinary bridoon bit, but tinned to prevent rust. The mouthpiece is fitted at each end with a ring to receive the iron stops on the reins when the ordinary packsaddlery reins are used, or for universal saddlery reins to buckle to. The "T" pieces are secured to the rings by links and solid loops, and are for fitting under the leather loops on the packsaddlery head collar.

Breeching, Mark V.—Is used for preventing the pack-saddle from slipping forward. The straps buckle to the body part of the breeching after being looped to the links on the pannels. It is supported by its hip strap, which passes through a loop on the crupper before buckling.

Collar, Breast, Mark V.—Is used to prevent the load from slipping back. The straps, after passing through the links of the pannels buckle to the body part of the breast collar. It is supported by its own neck strap.

Collar, Head, Mark IV.—Similar in design to the universal saddlery head collar, but the furniture is tinned iron, and it is fitted on the lower part of the headpiece with leather loops for the "T" of the bridoon bit to fit into, and with a ring on the noseband.

Crupper, Mark V.—Is made with forked straps, which after being looped to the rear arch of the packsaddle, buckle to the body of the crupper. The use of the crupper is to assist in preventing the saddle slipping forward.

Girths, Mark V.—Girths are made of worsted web. They are fitted with chapes and buckles at either end to connect up with the girth straps. These girths have no connecting piece as in earlier patterns, but may be crossed when girthing up if desired.

Girths, Leather.—Is a leather steadying girth, with a billet and buckle at each end. It can be lengthened by the "strap, extending."

Pannels, Mark V.—Each pannel consists of a leather back, with tan dowlas lining, the stuffing being horsehair. They are attached to the sidebars by leather pockets, the front pocket having a strap and buckle for securing purposes. An opening in the outer side admits of adjustment of the stuffing.

Pannels are fitted with links to take the straps of the Mark V breast collar or breeching—the hooks attached to such links are intended for the chains of earlier marks.

The stuffing can be adjusted as required and kept in position by additional spot stitches if necessary.

Straps, Girth, Mark II.—Are for buckling the packsaddle girth to. They are of leather, and made with a loop at one end.

Cap, Shovel, Mark II.—Is a leather cap, made to fit on the pan of the G.S. shovel. It has a detachable strap (apart from the "strap, shovel," which do not form part of the cap), which is used for securing it.

Straps, Pick and Helve, Shovel.—Are for use with the articles shown in the "Details of Sets."

The "straps, pick and helve" are for suspending the articles in question as part of the load.

The "strap, shovel," retains the handle of the shovel against the rear arch of the packsaddle.

Articles Special to Infantry Sets.

Trees, P.G.S.—Consists of two steel arches (to which rigid hanging hooks are riveted) connected by sidebars made from padouk or sabicu wood.

The arches are jointed to the sidebars to admit of them turning automatically, thus allowing of adjustment to the backs of large or small animals, or to meet loss of condition, and to obviate the necessity of several sizes.

The sidebars are slotted for the girth straps to loop on.

Bands, Belly.—These belly bands are broad leather girths 52½ in. in length by 3 in. in width, fitted at either end with a buckle and fixed leather loop to connect with the "straps, long," and "straps, short," which follow.

Straps, Long (or Straps, Short).—Are straps fitted at one end with a fixed leather loop. The long strap is 48 in. by 1½ in. and the short 40 in. by 1½ in.

Straps, Supporting.—These are narrow straps, 13 in. by $\frac{7}{8}$ in., which prevent the belly band dropping to the ground when the above-mentioned long and short straps are unbuckled to release the load.

Chains, Collar, P.G.S.—Are used for infantry in place of the headrope. It consists of a length of chain with a bent "eye" link at one end, and a "T" piece at the other. It is also fitted with two cross aperture links for the "T" to pass through as required.

Hanger, Tripod, Sling.—Is designed so that the tripod may be slung in it to the hooks of the packsaddle. It consists of a wood bearing bar, added to at the rear end by a wood block which keeps the tripod away from the animal's hip. Leather slings, felt lined, are attached to the bearing bar, the front sling being wider and longer than at the rear. Both slings are fitted at either end with metal dees for hooking to the packsaddle, and the upper dees are provided with strap and buckle for securing both dees after the tripod is slung.

Hanger, Gun, Sling.—Is constructed on the same principle as the tripod hanger, but is intended for the carriage of the gun. It differs from the tripod hanger in the following respects :—

The bearing bar is added to at **either** end by wood blocks which extend below it, and keep the gun sufficiently away from the side of the animal.

Both slings are of similar width.

A leather chape, carrying a metal square, is screwed to the centre of the bearing bar on the upper side for the "girth, leather" to buckle to when required.

Racks, Boxes, Belt, Ammunition, Infantry.—Consist of a canvas body with a wood bottom and rope slings. The body is bound with leather at the lower edge, as also at the four upper corners, and is attached directly to the wood bottom at its outside edges. No partitions are arranged, but a shaped metal plate is inserted at each corner in order to strengthen them and define the shape at the top.

The rack is suspended by a rope sling at either end, which passes under the bottom and outside the ends. A metal square is attached to the wood bottom for the leather girth to attach to, and holes are made for drainage purposes.

Reins, Bridoon.—The rein is made from Preller leather. It is fitted at each end with a tinned iron stop to connect with the rings of the bit.

5. To assemble the Parts.

General Instructions.

NOTE.—The front arch of the packsaddle tree is narrower than the hind arch.

Packsaddle.—The **tree** is the frame of the packsaddle. The **pannels** are attached to the tree by means of front and rear pockets, into which the sidebars are inserted. The front pockets are fitted with buckles and straps for securing purposes.

The **girth straps** are looped to the sidebars over the upper edge, through the slots cut for the purpose.

The **girths** are buckled to the girth straps on the off-side in readiness for use.

The **crupper** straps are looped to the rear arch of the packsaddle and then buckled to the body of the crupper.

Bit, Bridoon.—The **bridoon bit** at one end may be passed through the leather loop on the off-side of the head collar in readiness for "bitting" the animal.

Breechings; Collars, Breast.—The straps of the breeching are first looped to the links on the pannels and then buckled to the body part of the breeching. The straps of the breast collar, after passing through the links of the pannels, are buckled to the body part of the breast collar.

Instructions Special to Infantry Sets.

Bands, Belly, Straps, Long.—To be looped to the bearing bar of the gun hanger on the gun set, and the tripod hanger on the tripod set, by passing up behind the bearing bars of the respective hangers, and then through their own fixed loops, the loops remaining at the upper edge of the bearing bars.

Bands, Belly, Straps, Short.—To be looped to the near-side bar of the adjustable tree on the gun set, and the off-side bar of the adjustable tree on the tripod set, in a similar manner to that of the long strap, but the loops are to remain at the lower edge of the sidebars.

Bands, Belly, Straps, Supporting.—To be looped up through the slot in the "lay" of the pannel on either side of gun or tripod sets.

The **belly band** is afterwards buckled to these straps, and is supported by them whenever it is released from its long and short straps; it would otherwise drop to the ground.

Straps, Pick and Helve.—Looped to the bearing bar of the tripod hanger by passing down behind the bearing bar, and then through their own fixed loops.

Straps, Detachable, Shovel.—To be looped to the rear arch (near side) of the gun set, and the rear arch (off side) of the tripod set.

Saddling.—Before saddling it is essential that the animal's back should be free from dirt, and any dried sweat or matted hair brushed out. The pannels should be thoroughly dried, beaten, and free from any dirt or grit before being placed on the animal's back. Neglect of these precautions is the most fertile source of sore backs. Constant attention must be paid to the stuffing of the pannels and care taken to prevent them from becoming hard and lumpy.

When possible, animals should not be kept standing longer than is necessary when saddled and loaded.

If a saddle has shifted, do not try to push it into a better position; off-load, off-saddle, and resaddle properly.

Do not allow men to hang their rifles or equipment on the loads, or hold on to them on the march.

Girths may, if wished, be crossed under the animal's belly, and this method is often useful when there is a tendency for the girths to slip. When the girths are fastened the buckles should rest on the lower edges of the pannels, as this will prevent buckle galls.

The breeching and breast collar should be so fitted that movement of the animal is not impeded. Constant rubbing of either of these articles, when fitted too tightly, will inevitably cause galls.

The crupper requires careful fitting, as otherwise the animal's neck will be galled. A good rough guide is to arrange that the breadth of the hand will pass between the body of the breeching and the body of the crupper.

The bridoon bit should hang low enough to prevent the corners of the animal's mouth from being wrinkled.

6. Packsaddle Drill (Infantry).

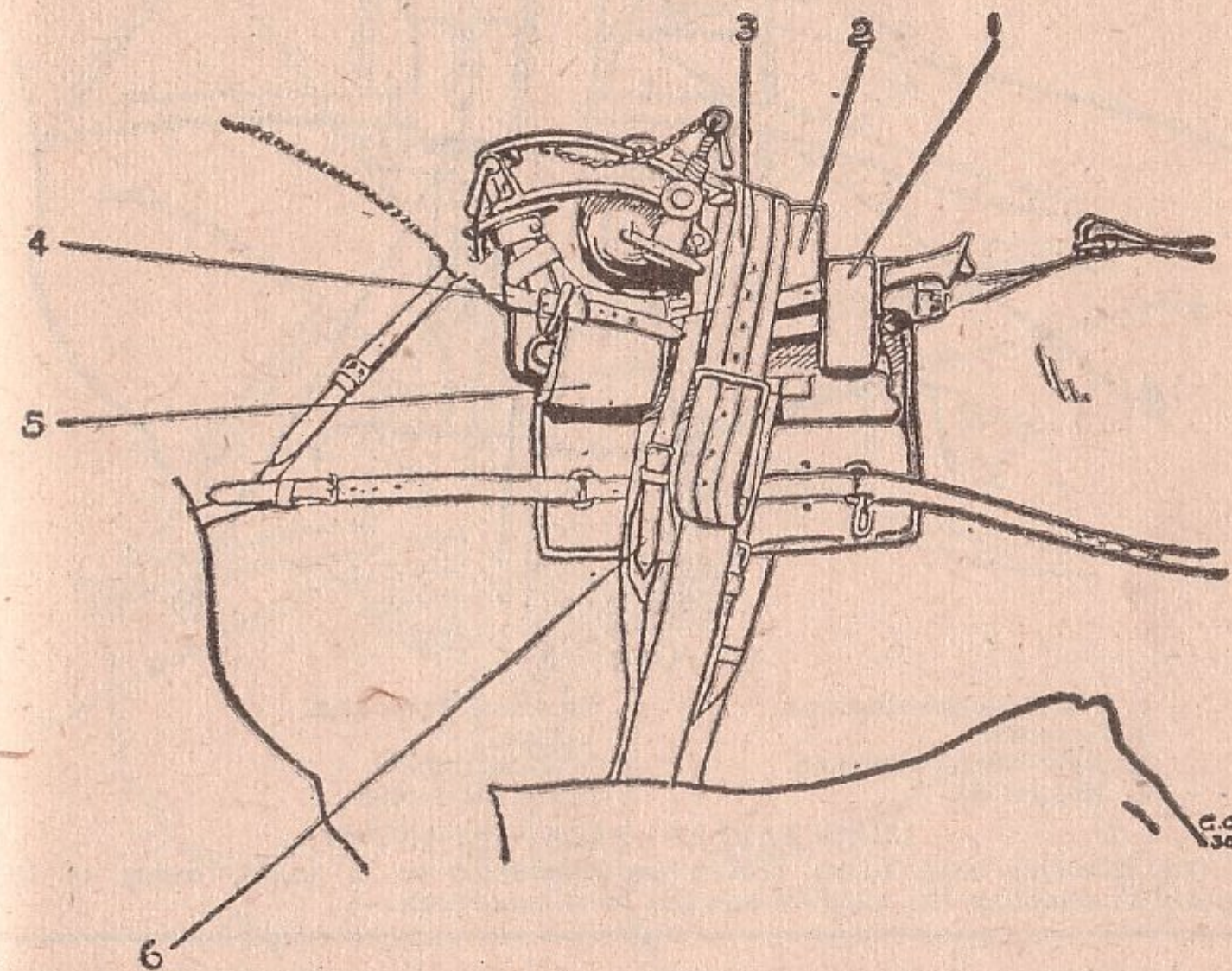
Instructor's Notes.

Stores :—

Two pack animals fitted with pack saddles, and feeds. Tripod, gun, condenser can and tube, spare parts case, cleaning rod, one case, cans, oil, eight single metal belt boxes or eight liners containing Mark VIII ammunition, one gun hanger, one tripod hanger, two surcingles, web, two ammunition racks, one water bucket.

PLATE 19.
INFANTRY.—GUN PACK ANIMAL.

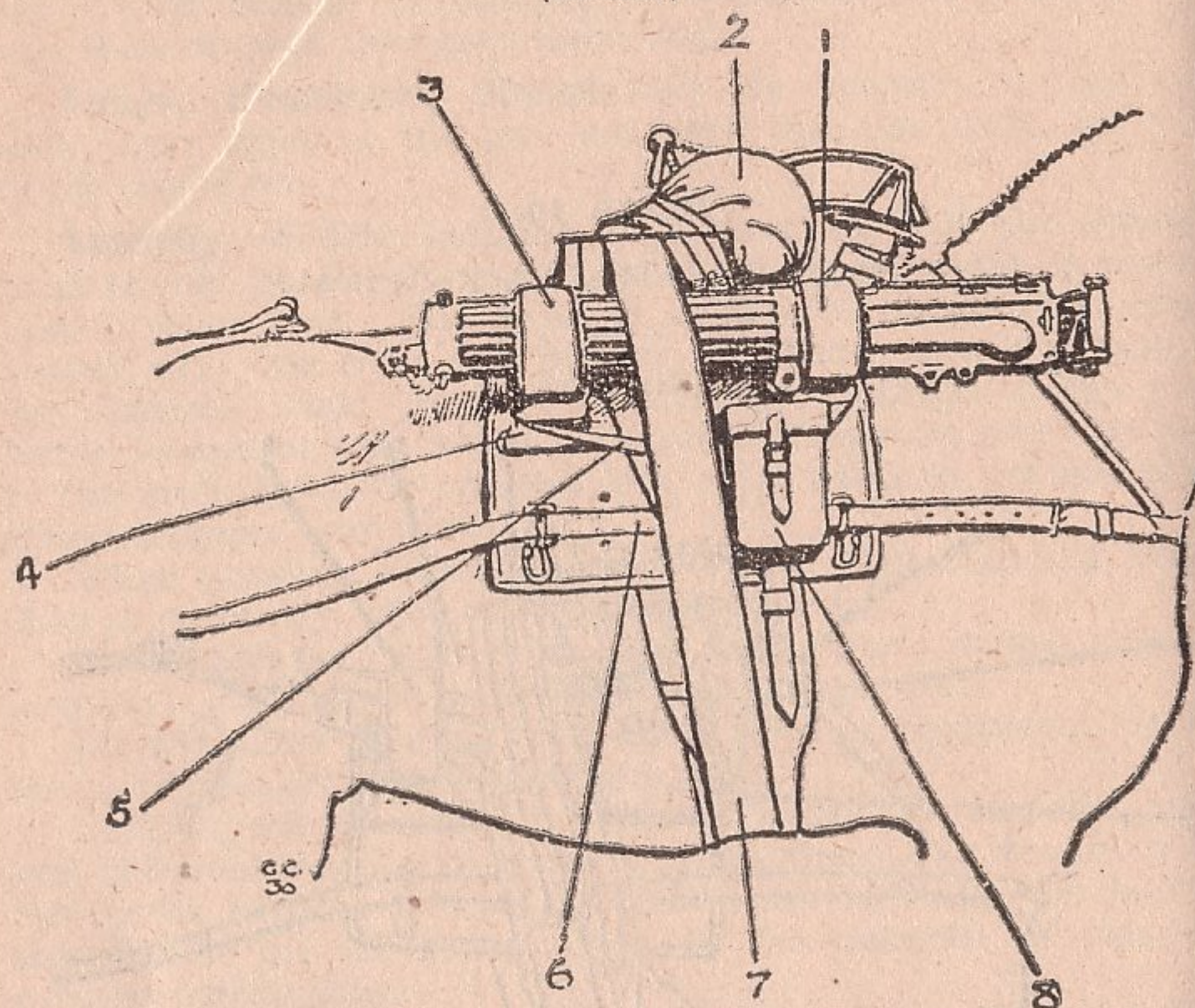
(Near side.)



KEY.

- | | |
|------------------------------|--------------------------------|
| 1. Rear hanger sling tripod. | 4. Strap securing tripod. |
| 2. Ammunition box. | 5. Front hanger sling tripod. |
| 3. Web surcingle. | 6. Securing strap tripod legs. |

PLATE 20.
INFANTRY.—GUN PACK ANIMAL.
(Off side.)



KEY.

- | | |
|----------------------------|-------------------------|
| 1. Front hanger sling gun. | 5. Securing strap, gun. |
| 2. Nosebat. | 6. Lay on. |
| 3. Rear hanger sling gun. | 7. Web surcingle. |
| 4. Hanger bar. | 8. Spare parts case. |

LOAD TABLES—PACK (INFANTRY).

The following load tables should be considered as a guide, owing to the necessity of adapting the loads to suit the local conditions:—

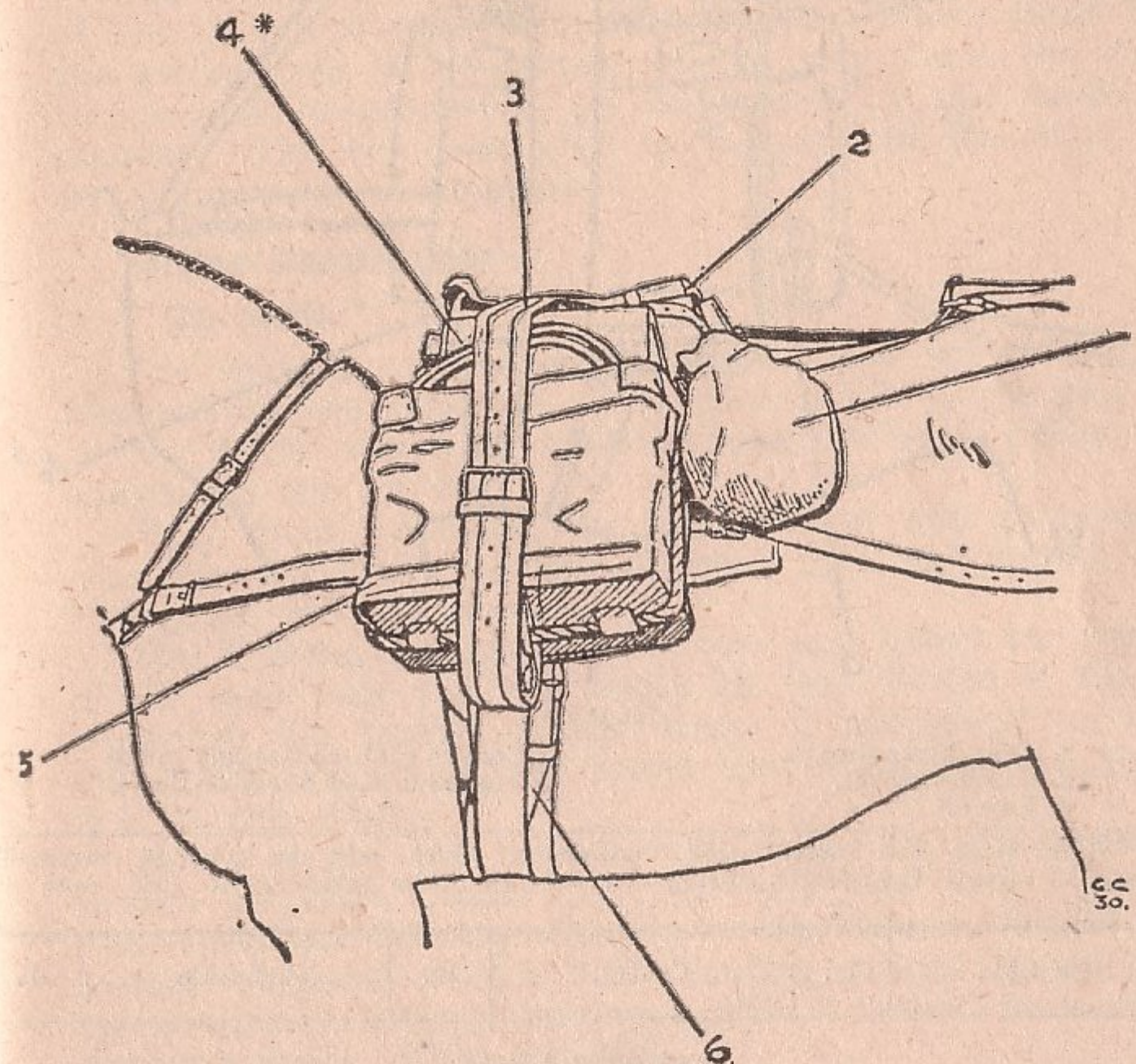
Near Side.	lb.	Centre.	lb.	Off Side.	lb.
GUN PACK.					
Tripod .. tripod ..	52	Ammunition box (stripless)	43	Gun, with barrel casing (filled)	42
Hanger, tripod, sling	9	Nosebag (filled) ..	8	Hanger, gun, sling	8
		Case, horse-shoe (filled)	3	Cleaning rod ..	1
				Spare parts case ..	8
Total ..	61	Total ..	54	Total ..	59

Recapitulation of Weights.

Near side	61
Centre	54
Off side	59
Pack saddle	28
Grand total	202

PLATE 21.
INFANTRY—AMMUNITION PACK ANIMAL.

(Near side.)



KEY.

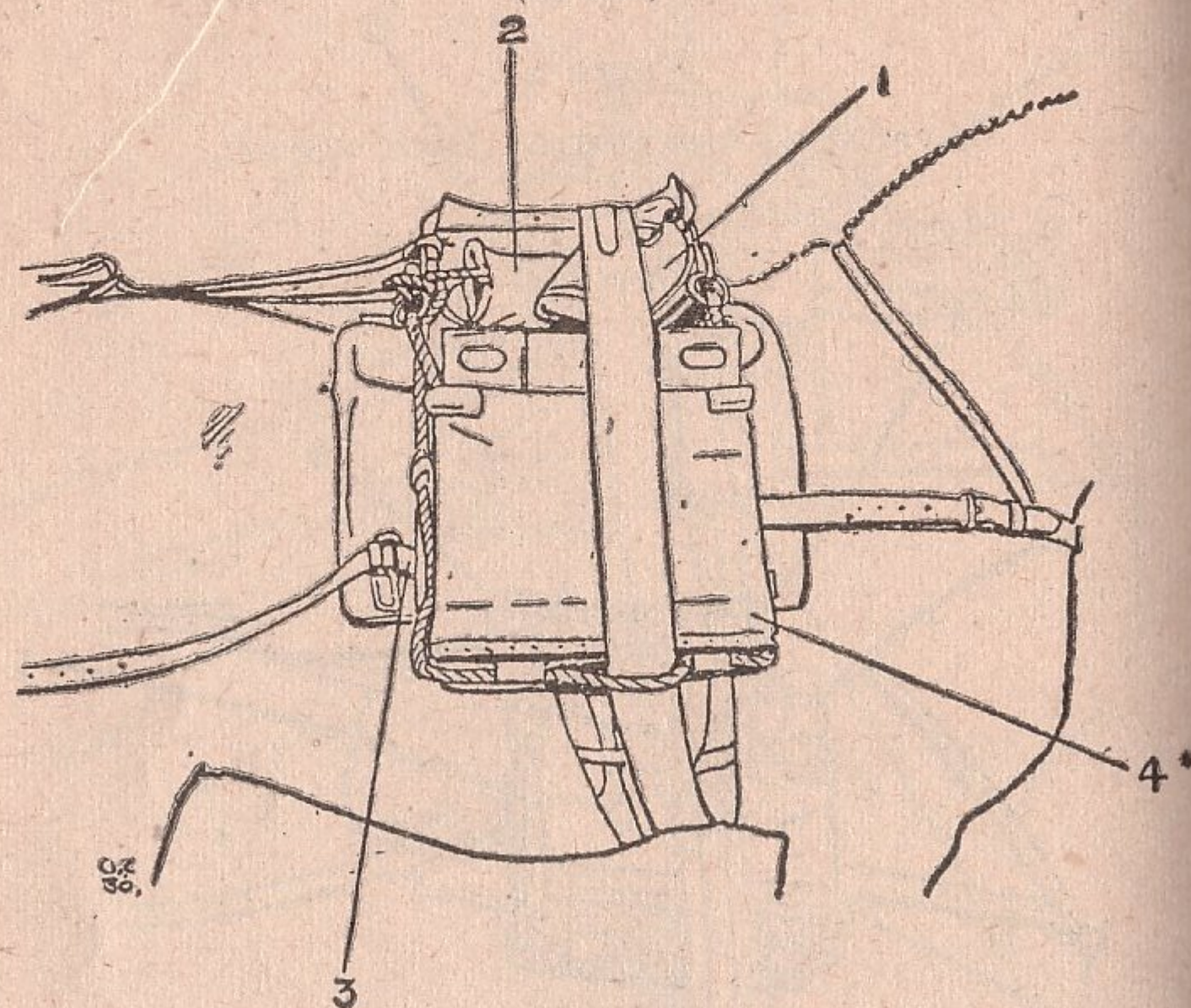
- | | |
|------------------------------|---|
| 1. Nosebag. | 5. Canvas rack containing metal ammunition boxes or liners. |
| 2. Cases, cans, oil. | 6. Steadying strap (leather girths). |
| 3. Surcingle. | |
| 4. Condenser can, with tube. | |

* With large size ammunition containers (metal), instead of two ammunition containers being packed horizontally, these will be packed vertically and the condenser can carried on top of the pack saddle.

PLATE 22.

INFANTRY—AMMUNITION PACK ANIMAL.

(Off side.)



KEY.

1. Case, horse-shoe
2. Canvas bucket.
3. Lay on.

4. Canvas rack containing metal
ammunition boxes or liners.

* With large size ammunition containers, three will be packed vertically instead of four, the fourth being carried in near side rack (see note to Plate 21).

Near Side.	lb.	Centre.	lb.	Off Side.	lb.
AMMUNITION PACK.					
2 boxes, belt (single), or liners	42	Bucket, canvas ..	1	4 boxes, belt (single), or liners	84
Rack, canvas ..	6			Rack, canvas ..	6
Case, cans, oil ..	8			Case, horse-shoe (filled)	3
Nosebag (filled) ..	8				
Condenser can ..	25				
„ tube ..	1½				
Carrier ..	3				
Total ..	93½	Total ..	1	Total ..	93

Recapitulation of Weights.

	lb.
Near side	93½
Centre	1
Off side	93
Pack saddle	28
Grand total	215½

The system of arranging a pack load is based on the following :—

- i. To avoid galling and sore backs the load must be of suitable weight, steady, and well balanced, so that the saddle rides evenly. Adjustment of loads may be necessary—e.g., if the barrel casing is not filled.
- ii. The arrangement of the load must facilitate speed in off-loading.

i. To load the Pack.

The following drill is written with reference to the packing of one gun and one ammunition pack. Where both guns of the section are to be carried at the same time, the duties of the section corporal will be duplicated by the section commander. The No. 5 referred to in this drill can either be the section orderly or rangetaker.

Section Commander—

“On pack.”

The section corporal takes forward the tripod hanger and places it on the near side of the pack saddle of the gun animal.

No. 3 first removing the feed from the hook, places the gun hanger on the off side.

They then unbuckle the girth straps and rebuckle them over the wooden crossbars of both gun and tripod hangers. The girths will be crossed.

No. 3 takes the spare parts case and hangs the sling strap of the case over the two hooks on the off side of the saddle, adjusting the length of the strap, if necessary, so that the top of the case will just touch the bottom of the gun when it is in the slings.

No. 1 takes the tripod, and, with the assistance of the section corporal, places it in the rear side slings, legs to the rear, crosshead leaning towards the front arch. No. 1 and the section corporal buckle the securing straps. Care must be taken that no inner jamming handle is turned back on to the leather pannel of the saddle.

No. 2 takes the gun, and, with the assistance of No. 3, who takes up the cleaning rod, places it in the off side slings, muzzle to the rear, the front sling being passed over the feed block and the rear sling over the barrel casing.

Nos. 1 and 2 fix the straps, long and short, which are on the bars of the hangers, round the tripod legs and gun respectively, and buckle them on to the steadying strap.

No. 2 buckles the securing straps.

No. 3 then takes the cleaning rod and pushes it through the gun slings, front to rear, where the metal rings are held by the leather slings.

No. 3 takes one ammunition box and places it across the saddle, the ends fitting between the gun on the off side and the legs of the tripod on the near side.

No. 2 takes the feed and places it on the top of the ammunition box, securing the strap of the nosebag to the rear arch of the saddle.

The section corporal brings forward the web surcingle, and, assisted by No. 2, passes it through the metal straps of the ammunition box, over the feed, and under the belly, securing it on the near side.

No. 4 takes forward the full ammunition rack and case, cans, oil, and No. 5 the other loaded rack, together with the surcingle and canvas bucket.

No. 4 places the case, cans, oil, between the arches of the saddle of the ammunition animal, passing the strap around the arches and adjusting the length of the strap as necessary.

No. 5 places the canvas bucket between the front and rear arches of the saddle, the rope handle going under the rear arch and on the rear off side hook of the tree.

Working together, No. 5 on the near side and No. 4 on the off side hang the racks on the pack saddle hooks, the metal "D's" on the bottom of the racks being nearest to the animal. They fasten the steadying strap (leather girth). When long enough, each end is passed through the slot in the "lay on" of the saddle, then through the metal "D" in the rack and the strap is buckled.

No. 5 fastens the other feed from the gun animal on to the rear arch on the near side.

Nos. 4 and 5 pass the web surcingle round the two racks, over the condenser can and ammunition boxes, and under the animal's belly and buckle it on to the near side.

NOTE.—There is no provision for carrying certain parts of the machine gun equipment—*e.g.*, the range-finder, spare parts box, or the indirect fire equipment—and the amount of ammunition carried is limited. The rangefinder will carry his instrument in the canvas case. Any additional equipment required must be carried by the gun numbers.

ii. To off-load the Pack.

Section Commander—

"Off pack."

The numbers detailed in "On pack" will take off the stores.

The order in which they are taken off will be the reverse to "On pack."

iii. To prepare for Action (Pack).

Section Commander—

"Prepare for action."

Nos. 1 and 2 double to the gun and tripod pack and remove the tripod and gun respectively.

No. 3 doubles to the gun and tripod pack and removes the box of ammunition, spare parts case, and cleaning rod. He hands the spare parts case to No. 2.

No. 4 doubles to the ammunition pack, removes two metal belt boxes or liners from the off side, and the condenser can and tube from the near side.

He hands the condenser can to No. 3 and tube to No. 2.

If more ammunition is required, No. 5 will remove the same and pass it to No. 4.

The section corporal organizes loads as necessary, and, with No. 5 squares off all loose gear and straps after the stores have been removed.

iv. To come into Action.

Section Commander—

"Action."

Nos. 1, 2, and 3 act as in elementary gun drill.

v. To cease Firing.

Section Commander—

"Cease firing."

Nos. 1, 2, and 3 act as in elementary gun drill.

When signalled for, the pack animals, under orders of the section corporal, move forward to a position immediately in rear of the gun position, and the packs prepared to receive the equipment.

Section Commander—

"On pack."

The numbers will load the packs as in para. 6, i, above.

APPENDIX III.

MODIFICATIONS TO LESSONS WHEN UNITS ARE
EQUIPPED ONLY WITH CLINOMETERS AND
BAR FORESIGHTS.

NOTE.—The following stores will be packed in each subsection truck:—

- I clinometer.
- I bar foresight.
- I aiming post.
- I night aiming lamp.

LESSON 56A.—CONTROLLED CORRECTIONS—
INDIRECT.

Instructor's Notes.

Additional stores:—

Bar foresight, aiming post.

Before this lesson No. 1 must have received instructions in the use of the graduations on the handwheel and in aiming over the bar foresight. He should have an elementary knowledge of the function of the aiming post.

The gun will be mounted, bar foresight affixed, and an aiming post planted about 10 yards in front of it. The sights will be set at 2,500, and the instructor will lay the gun on the bull. The gun will be loaded and fire opened before the exercise begins.

To execute an order correcting the elevation when firing indirect.

"Stop" — **"All up (or down) degrees minutes"** — **"Go on."**

No. 1, using the graduations on the handwheel, elevates or depresses the gun through the angle ordered. He readjusts his line of sight on to the bull by moving his tangent sight slide up or down.

LESSON 65A.—PREPARE FOR ACTION AND
COME INTO ACTION.

Details as in Lesson 65, except that Nos. 2 will remove clinometer and bar foresight, putting the strap over their left shoulder, and each No. 3 will remove an aiming post.

LESSON 66A.—CEASE FIRING AND ON TRUCKS.

Both Nos. 3 will act as detailed for No. 3 of the odd subsection in Lesson 66. If aiming lamps are in use, Nos. 4 will return them to the trucks on their first journey.

LESSON 70A.—TO CONTINUE FIRING IN THE EVENT
OF THE TARGET BECOMING OBSCURED.

As in Lesson 70, except for the following:—

Para. 1.—After section commander orders **"Pick up gun aiming marks"**:—

No. 1 picks up an aiming mark.

No. 2 sets tripod dial at zero, checks elevation with the clinometer, and notes the aiming mark and the setting on the tangent sight slide.

Para. 2.—After the order **"Out aiming posts"**:—

Aiming posts are planted as taught in Lesson 37A.

For Tests 7 (b) and (c) and 8 substitute:—

Name of Test. (1)	Conditions before Test. (2)	No. of Tests. (3)	Time allowed. (4)	To pass. (5)	Remarks. (6)
7A. (b) Indirect fire (elevation)	Gun loaded and laid on aiming post. Elevation checked by clinometer. Order to fire is given	Three	6 seconds from command ".... minutes, Go on" until No. 1 has pressed the thumb-piece	Correct elevation within 2 minutes. Slide correctly adjusted	Corrections will not exceed 45 minutes.
(c) Indirect fire (deflection)	The No. 2 to be tested will kneel by the barrel of the gun, hands to be clear of the bar foresight, which will be clamped on the gun, foresight at zero	Three	6 seconds from command "R (or L) minutes"	All three correct ..	Corrections will be in degrees or tens of minutes.
8A. (a) Clinometer	Clinometer in its case and set at zero, rear cover open, gun approximately level	One	20 seconds from the time an elevation is ordered until the elevation is placed on the gun	Correct elevation within 2 minutes	An order for elevation or depression of not more than 4 degrees will be given. The order will always include a multiple of 5 minutes.
(b) Gun dial	Gun mounted, laid on zero post. Dial at zero, and clamped	One	5 seconds from command "All R (or L) degrees minutes" until the switch is completed and the clamp tightened	Correct within 20 minutes	Switch to be not less than 40 degrees.

LESSON 71A.—TO MAKE PREPARATIONS IN DAY-LIGHT TO CONTINUE FIRING IN DARKNESS.

*Instructor's Notes.**Additional stores:—**Torches and aiming lamps.*

NOTE.—Section commander sends for section corporal, Nos. 4, and any night firing stores which are not already at the gun position.

Section Commander—**"Prepare for night firing."**

The section commander takes post at No. 1 gun, the section corporal at No. 2 gun.

No. 1 relays on target (or aiming post if firing indirect).

No. 2 sets dial at zero and takes the elevation on the gun with the clinometer. He attaches the bar foresight if not already on.

Nos. 4 bring up the night firing boxes and torches, hand one torch to the section commander or the section corporal, and the aiming lamps to Nos. 3. Nos. 3 extract the night sights and hand them to Nos. 2.

No. 2 fixes the night sights, and the section corporal reports to section commander **"No. Ready."**

Section Commander—**"Unload" — "Clear guns" — "Out aiming lamps."**

Nos. 3 will plant aiming lamps, as in Lesson 85A.

The section commander will order **"Load"** and **"Fire"** as required.

LESSON 72A.—TO CHANGE FROM NIGHT FIRING TO DIRECT FIRE.

*Instructor's Notes.**Additional Stores.—As for Lesson 71A.***Section Commander—****"Prepare for direct fire."****"Unload" — "Clear guns."****"In aiming lamps."**

Both Nos. 3 act as detailed in Lesson 72.

Nos. 1 remove night backsights and hand them to Nos. 2.

Nos. 2 remove night foresights and bar foresights.

Nos. 3 will collect night sights, replace them in the night aiming box, and put the box in a place of safety until it can be returned to the truck.

LESSON 74A.—TO COME INTO ACTION.

As in Lesson 74, except that Nos. 2, having mounted the gun, kneel on their left knees on the right side of the gun and affix the bar foresights.

Nos. 3 do not plant aiming posts.

LESSON 75A.—CEASE FIRING AND ON TRUCKS.

Detail as in Lesson 75, except that on the order "**Cease firing**" Nos. 2 will remove bar foresights before the guns are dismounted.

LESSON 76A.—DIRECTOR METHOD.

Instructor's Notes.

This method should be practised, using the director in different positions in relation to the guns.

Senior Section Commander—

"All—on director."

Nos. 1 lay on the director, using the gun foresight, and when laid, Nos. 2 set the dial at zero.

Junior section commander acts as in Lesson 76.

Platoon Commander—

"Zero lines."

"No. Right (or left) degs. mins. "

"No. " " " "

"No. " " " "

"No. " " " "

Nos. 2 swing their guns through the angle ordered and reset the dials at zero.

LESSON 77A.—POST METHOD.

Instructor's Notes.

Additional stores:—

Two zero posts.

The senior section commander marks the position (with reference to the posts) over which the pivot gun will be mounted.

On the order "**For indirect fire—Mount gun**" Nos. 1 and 2 of the pivot gun align the gun on the posts, moving

the tripod right or left until the line of sight through the tangent sight is in exact alignment of the posts. When this has been checked by the senior section commander, Nos. 1 and 2 stamp in the tripod, the senior section commander rechecks the line of sight, and ensures that the gun dial is set at 180 degrees.

Senior Section Commander—

"All—on No. "

Nos. 1 of the remaining guns lay on the socket of the pivot gun. When laid, Nos. 2 set their dials at zero.

Senior Section Commander—

Lays the pivot gun on to the socket of each gun in turn and orders:—

"Zero lines."

"No. Right (or left) degs. mins. "

"No. " " " "

"No. " " " "

Nos. 2 swing their guns through the angle ordered and reset the dials at zero.

No. 2 of the pivot gun finally swings his gun back to 180 degrees and resets the dial at zero.

Junior Section Commander.—Takes up his position on the flank of the gun farthest from the pivot gun, repeats the angle to the senior section commander, and checks for parallelism as in director method.

Senior Section Commander.—Reports to fire controller—

"Guns on zero lines."

No. 3 of the pivot gun brings in the fire controller's posts.

LESSON 78A.—COMBINATION OF DISTANT AIMING POST AND POSTS (OR TARGET).

The fire controller or senior section commander will select and measure the angle between the distant aiming point and posts, using the director as in Lesson III, 2. Should the dial be used for this purpose the senior section commander will adopt the following procedure:—

He will lay the gun at the distant aiming point, set the tripod dial at zero, swing the gun back to the zero posts, and note the angle.

Senior Section Commander—

"All on D.A.P."

Section commanders lay on the distant aiming point. Nos. 2 zero the dials.

"Zero lines—All right (or left) degs. mins. "

Nos. 2 will swing the guns through the angle ordered, tighten the traversing clamp, and zero the dial.

Junior Section Commander.—Repeats the angle. Checks the line of all guns for parallelism.

Senior Section Commander.—Reports to fire controller—
“Guns on zero lines.”

No. 3 of the pivot gun brings in the fire controller's posts, if put out.

LESSON 79A.—T.O.G. METHOD.

No change in method.

LESSON 80A.—TO PLACE THE NECESSARY ELEVATION ON THE GUN.

Fire Controller—

“Elevation (or depression) No. (or all) degs. mins.”

Nos. 2 act as taught in Lesson 31A, Nos. 1 testing for crest clearance as in Lesson 80.

Senior Section Commander—

“Out aiming posts.”

Nos. 3 plant aiming posts as directed by Nos. 1.

After aiming posts have been planted, Nos. 1 test the adjustment of their clamps, finally relaying on the bull.

Senior Section Commander—

“Guns ready to load.”

Fire Controller—

“Load.”

LESSON 81A.—DISTRIBUTION AND CORRECTIONS.

Fire Controller—

“Distribution.”

“No. Nil.”

“No. Right (or left) degs. mins.”

“No. ” “ ” “ ”

“No. ” “ ” “ ”

No. 2 sets the bar foresight at the angle ordered.

No. 1 taps the gun across until his line of sight is on the aiming post.

If distribution is ordered, Nos. 1 and 2 check elevation as follows :—

No. 1 raises the rear cover.

No. 2 places the clinometer on the outside plates and levels the bubble by turning the handwheel.

No. 1 adjusts his tangent sight slide so that the line of sight is on the aiming post and notes the reading.

To tap Right and Left.

As in Lesson 81.

To make Allowance for Side Winds.

Fire Controller—

“Wind right (or left) degs. mins.”

No. 2 sets the bar foresight at the amount ordered. (If the bar foresight is not at zero he adds or subtracts this amount to or from the angle on the bar foresight.)

No. 1 taps the gun over until the line of sight is on the aiming post.

i. **Direction.**

Fire Controller—

“Stop”—“All right (or left) degs. mins.”—“Go on.”

No. 2 alter bar foresight accordingly.

Nos. 1 relay and carry on firing.

ii. **Elevation.**

Fire Controller—

“Stop”—“All up (or down) mins.”—“Go on.”

Nos. 1 act as taught in “controlled corrections—indirect.” (If the correction ordered is down, they will recheck for crest clearance.)

Nos. 2 add or subtract the angle ordered to or from the setting on the clinometer.

NOTE.—Elevation *must* be given as a quadrant angle, and not as a combination of range and angle of sight.

LESSON 82A.—TO ENGAGE A NEW TARGET.

Fire Controller—

“Stop”—“All on zero lines.”

No. 2 sets the bar foresight at zero.

No. 1 relays on aiming post.

No. 2 sees that the dial is at zero.

Fire Controller—

“All—Right (or left) degs. mins.”

(a) Where the angle ordered can be put on bar foresight—

No. 2 sets bar foresight at angle ordered.

- (b) Where the angle ordered cannot be put on bar foresight—No. 2 swings the gun through the angle ordered by means of the direction dial.

Fire Controller—

“Elevation (or depression)—No. (or all) degs. mins.”

Elevation or depression is placed on the gun as before.

- (a) Where the angle of switch ordered can be put on bar foresight—No. 1 readjusts his line of sight on to his aiming post. He ascertains whether his gun will clear the crest and the aiming post.
- (b) Where the angle of switch ordered cannot be put on the bar foresight—

Platoon commander. — “Unload” — “Clear guns” — “Out aiming posts” — “Load,” &c.

Or platoon commander orders No. 1 to pick up a gun aiming mark and then continues with the fire order.

LESSON 83.—FIRE CONTROL CHARTS.

No change.

LESSON 84A.—PREPARE FOR ACTION AND COME INTO ACTION.

Instructor's Notes.

Additional stores :—

Two subsection trucks.

Section Corporal—

“.... Belts—for night firing—Prepare for action.”

As in Lesson 73A, with the addition that Nos. 4 will remove night aiming lamps, and gun numbers will remain in front of trucks.

The section corporal is responsible that all the necessary stores have been removed from the trucks. He will then detail loads and move the section forward to a position in rear of the gun pegs.

To come into Action.

Section Commander (or Section Corporal)—

“No. For night firing—Mount gun.”

No. 1 moves forward with his tripod to a position pointed out to him by the section commander or section corporal a few feet in rear of the gun peg. He mounts his tripod, removes the crosshead, and, with the assistance of the section

commander—or section corporal, places the tripod so that the cross-wires are directly above the peg. He stamps in the shoes, and after the section commander or section corporal has satisfied himself that the mounting is directly above the gun peg, No. 1 replaces the crosshead.

He calls up No. 2.

No. 2 mounts gun on tripod, fixes the bar foresight and the night-firing sights when the latter are handed to him by No. 3.

No. 3 brings forward aiming post, condenser, and ammunition box. He places the condenser and ammunition box beside the gun in the normal manner and returns to No. 4.

No. 4 hands over the night aiming box to No. 3 who proceeds to the gun position, gives the night sights to No. 2, and awaits further orders. One No. 3 will accompany the section commander to the direction pegs when ordered.

LESSON 85A.—TO OBTAIN DIRECTION AND ELEVATION.

To lay the Gun in the Required Line.

The section commander informs the section corporal which direction peg he is going to first. Accompanied by a No. 3 with an aiming lamp he will place the lamp as low down as possible behind the direction peg, with the peg outlined down the centre of the lamp.

Section Commander—

“No. Direction.”

No. 1 of the gun named aligns gun on lamp.

No. 2 sets the dial at zero.

The section corporal checks the line and dial of each gun in turn, reporting **“No. correct”** as soon as he has finished.

To give Elevation to the Gun.

Section Commander—

“Elevation (or depression) degs. mins.”

Nos. 1 and 2 place elevation on the gun (assisted by supervising N.C.O.).

No. 1 sets sight at 2,500.

Section Commander—

“Out Aiming lamps.”

Nos. 3 will move out in front of the guns taking the aiming lamps and posts. They will switch on the light, place the lamp on the post, and plant the post as directed by No. 1.

They will then anchor the box, connect the cord and return it to the N.C.Q. at the gun position.

They will report "**In**" to the section commander and then complete their ammunition duties.

The remainder of the drill in action is as for indirect fire.

LESSON 86A.—CEASE FIRING AND ON TRUCKS.

Section Commander—

"Unload"—"Clear gun"—"In aiming lamps."

Nos. 1, 2, 3, and 4 carry out their duties as in Lesson 72A.

Section Commander—

"Cease firing."

Gun numbers will act as in Lesson 66, section drill, direct fire.

After the guns have been dismounted, the section commander will fall in the section, and check stores. He is himself responsible for the pegs.

The section will move back to the trucks led by the section corporal, the section commander moving in rear; on arrival the section commander orders "**On trucks.**"

This drill will be carried out as in section drill, direct fire. The section commander will place the pegs in his truck.

LESSONS 87 TO 94.

No change.

APPENDIX IV (N.Z.).

LESSON 71B.—TO MAKE PREPARATIONS IN DAYLIGHT TO CONTINUE FIRING IN DARKNESS (FOR UNITS EQUIPPED WITH MARK II AIMING LAMPS).

Instructor's Notes.

Additional stores: Two torches, one night firing box.

NOTE.—Section commander sends for section corporal, No. 4 of odd subsection, and any night firing stores which are not already at the gun position.

Section Commander—

"Prepare for night firing."

The section commander takes post at No. 1 gun, the section corporal at No. 2 gun.

No. 1 relays on target (or aiming post if firing indirect).

No. 2 sets dial at zero and takes the elevation on the gun with the clinometer. He attaches the bar foresight if not already on.

No. 4 of the odd subsection brings up the night firing box and two torches, and hands one each to the section commander and the section corporal.

He places the night firing box between the subsections and lies down in rear of it, having first extracted the night sights and handed them to Nos. 2.

No. 2 fires the night sights and the section corporal reports to section commander "**No. Ready.**"

Section Commander—

"Unload"—"Clear guns"—"Out aiming lamps."

No. 4 of the odd subsection hands night aiming lamps to Nos. 3, who will move out in front of the guns, taking with them aiming posts if not already planted. They plant night aiming lamps under the direction of No. 1 and return by the flanks, reporting to the section commander when in.

Section commander orders "**Load**" and "**Fire**" as required.

LESSON 72B.—TO CHANGE FROM NIGHT FIRING TO DIRECT FIRE (FOR UNITS EQUIPPED WITH MARK II AIMING LAMPS).

Instructor's Notes.

Additional stores : As for Lesson 71B.

Section Commander—

“Prepare for direct fire.”

“Unload ”—“Clear guns.”

“In aiming lamps.”

Nos. 3 pick up the aiming posts, holding the aiming post in one hand and the cable in the other. If the lights are on, No. 4 switches them off.

As Nos. 3 move in, No. 4 winds in the cable. He should hold the body of the box between his knees, turn the handle with his right hand, and with his left hand lead the two cables regularly across the drum. Regularity in winding is essential.

Nos. 3 remove the lamps from the aiming posts, hand them to No. 4, who replace them in the box, closes the box and restores the folding handle to its slot.

Nos. 1 remove night backsights and hand them to Nos. 2.

Nos. 2 remove night foresights and bar foresights.

No. 4 of the odd subsection collects the night sights from Nos. 2 and the torches from the section commander and section corporal, and replaces them in the truck or in a place of safety.

NOTE.—Aiming posts may be left in position and indirect fire equipment may be retained at the guns in readiness for smoke, &c.

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